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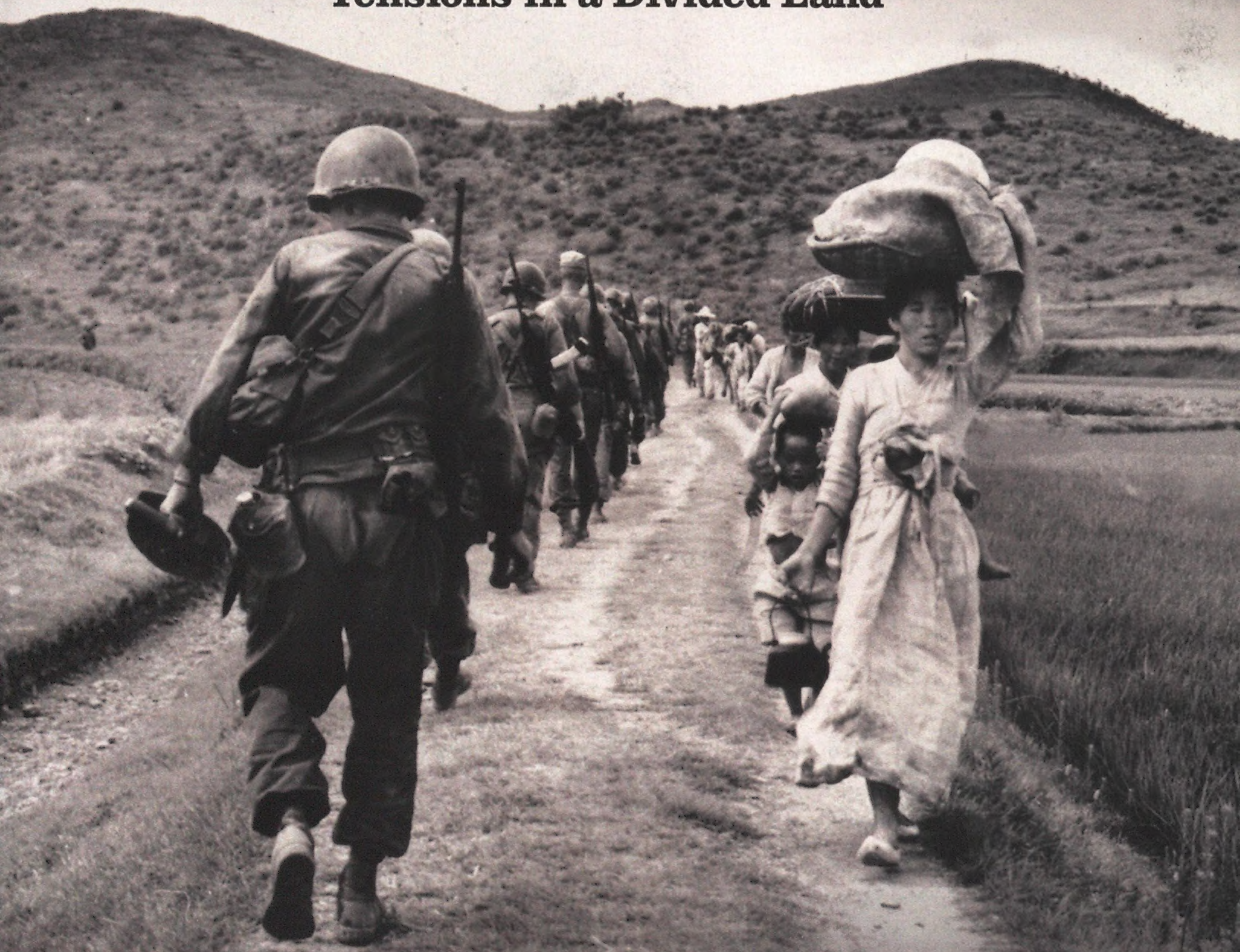
FIFTY YEARS LATER

KOREA

Tensions in a Divided Land



Mystery of the Anasazi: What Drove the Cliff Dwellers Away?
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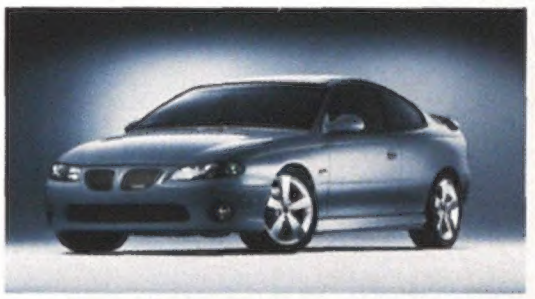

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[1]According to R.L. Polk & Co., statistics for Overall Manufacturer Loyalty in 2002 model year, GM ranked highest by having the greatest percentage of households return to purchase or lease another GM vehicle. [2]The General Motors Corporation Oshawa #1, Ontario plant was ranked highest and the Lansing, Grand River, MI plant was ranked second highest in North/South America among plants producing vehicles for the U.S. market in J.D. Power and Associates 2003 Initial Quality Study.[SM] Study based on a total of 52,105 U.S. consumer responses indicating owner reported problems during the first 90 days of ownership. www.jdpower.com. *Limited availability. See dealer for details.

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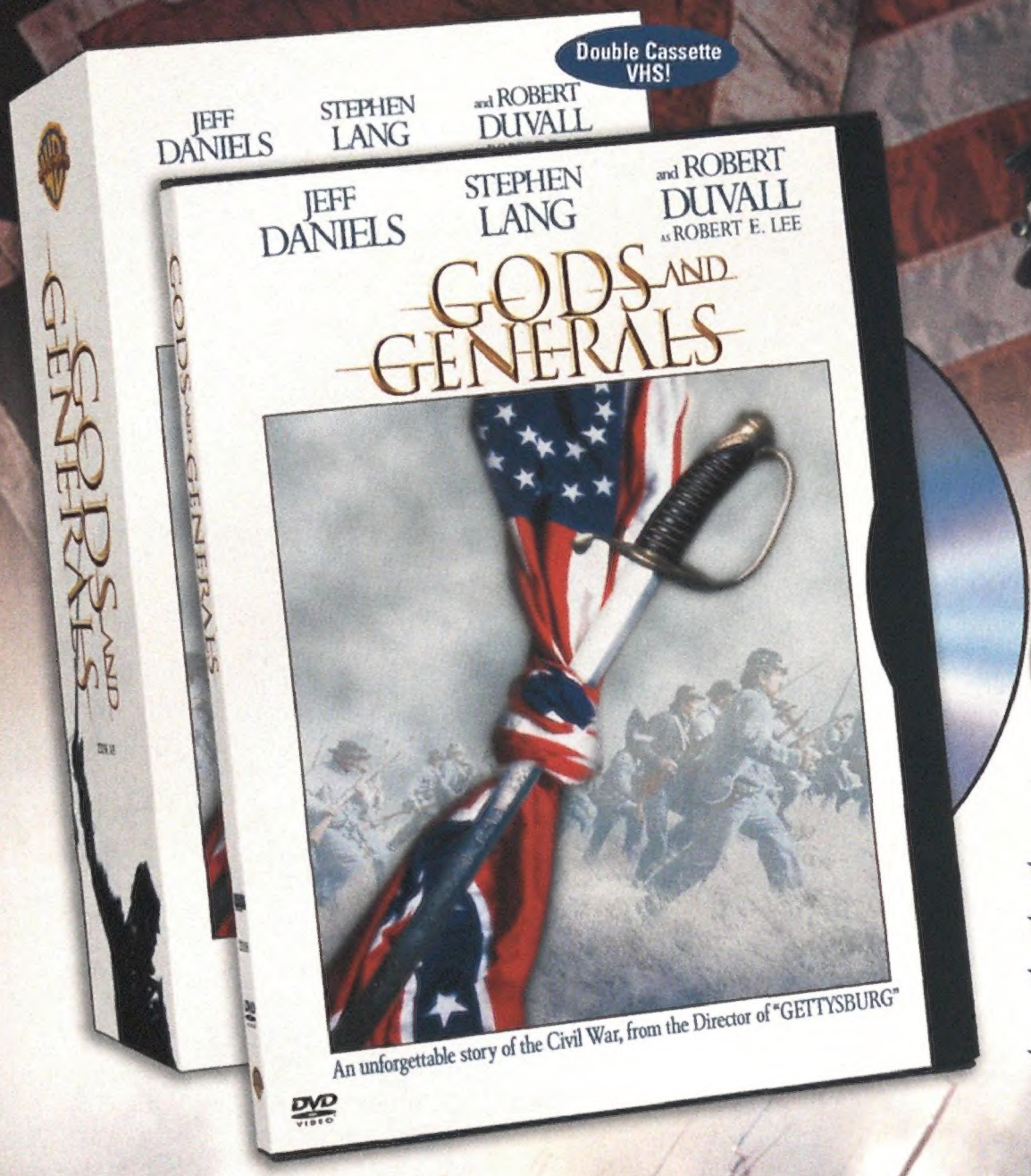

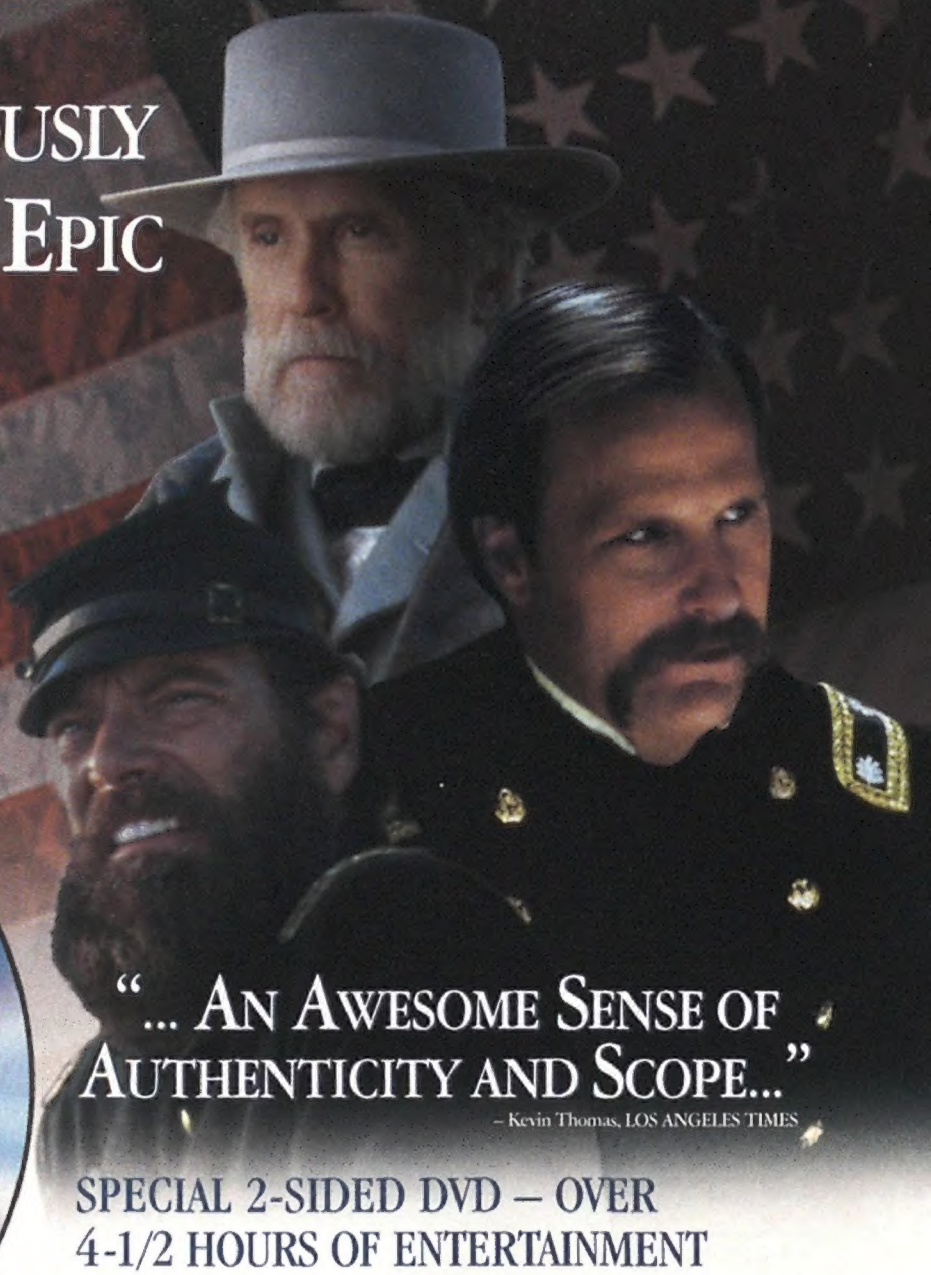

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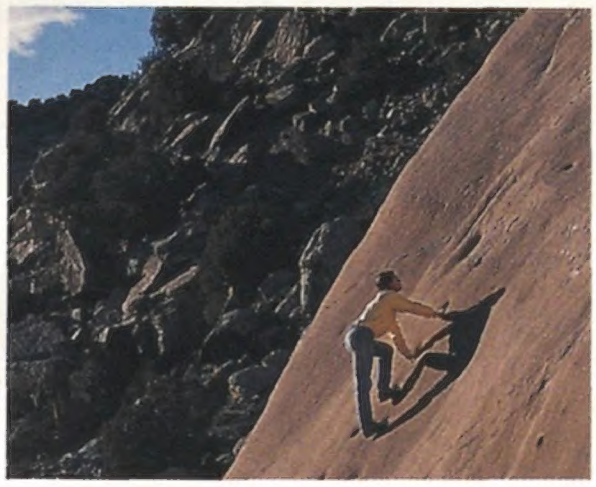
FEATURES

"AFTER MIDNIGHT, Lee told a cavalry officer, 'I never saw troops behave more magnificently than Pickett's division of Virginians. . . .' Then he fell silent, and it was then that he exclaimed . . . 'Too bad! Too bad! OH! TOO BAD!'"
—"MAKING SENSE OF ROBERT E. LEE," PAGE 58



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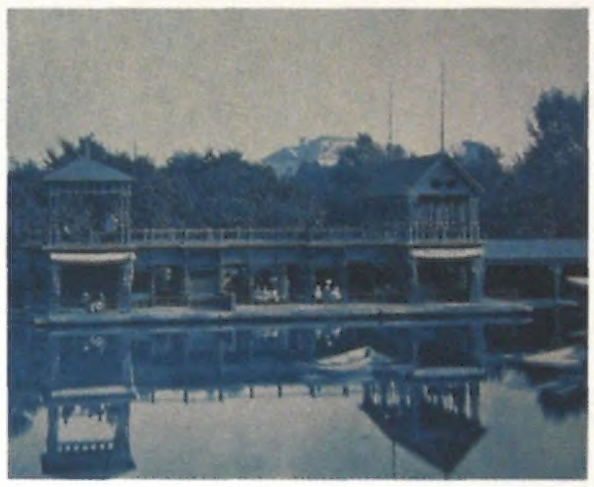
50 Egypt's dazzling burial art aspired both to beauty and to functionality.



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BY WITOLD RYBCZYNSKI

88 ON THE TRAIL OF THE WEST NILE VIRUS
As the mosquito-borne disease spreads across the nation, scientists are discovering that the virus may be more insidious than originally thought
BY STEPHEN S. HALL / PHOTOGRAPHS BY GREG MILLER

ON THE COVER The Korean War took a toll on civilians (fleeing as U.S. troops advance), killing or wounding four million and turning another five million into refugees. *PHOTOGRAPH FROM BETTMANN / CORBIS.*

38 At Dongdaemun, one of Seoul's largest shopping districts, consumers can purchase everything from knockoff Armani suits to traditional Korean dresses, called *hanbok*.

GREG CHILD; EGYPTIAN MUSEUM, CAIRO; AUGUST HEPP / MUSEUM OF THE CITY OF NEW YORK; BENJAMIN RONDEL / CORBIS

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JULY 2003 VOLUME 34, NUMBER 4

DEPARTMENTS

"THE MEN IN THIS PICTURE are butter and egg men. They liked to joke that their wives were fat because they buttered their toast on both sides."
—"RULING THE ROOST," PAGE 19

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15 In 1963, the Postal Service enlisted Mr. ZIP to help promote the new routing code.

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26 Cycling's premier race, the Tour de France, was first held 100 years ago this month.

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GAIL MOONEY; NATIONAL POSTAL MUSEUM, S.I.; SUBNANKAR BANERJE; ERIC GAILLARD / REUTERS

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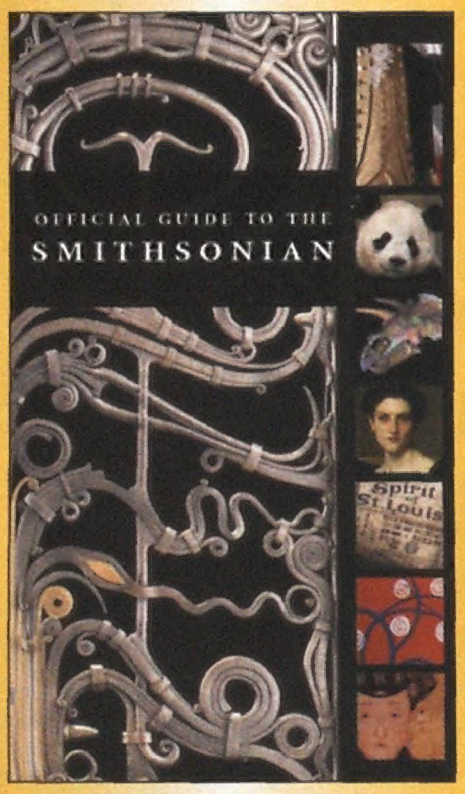

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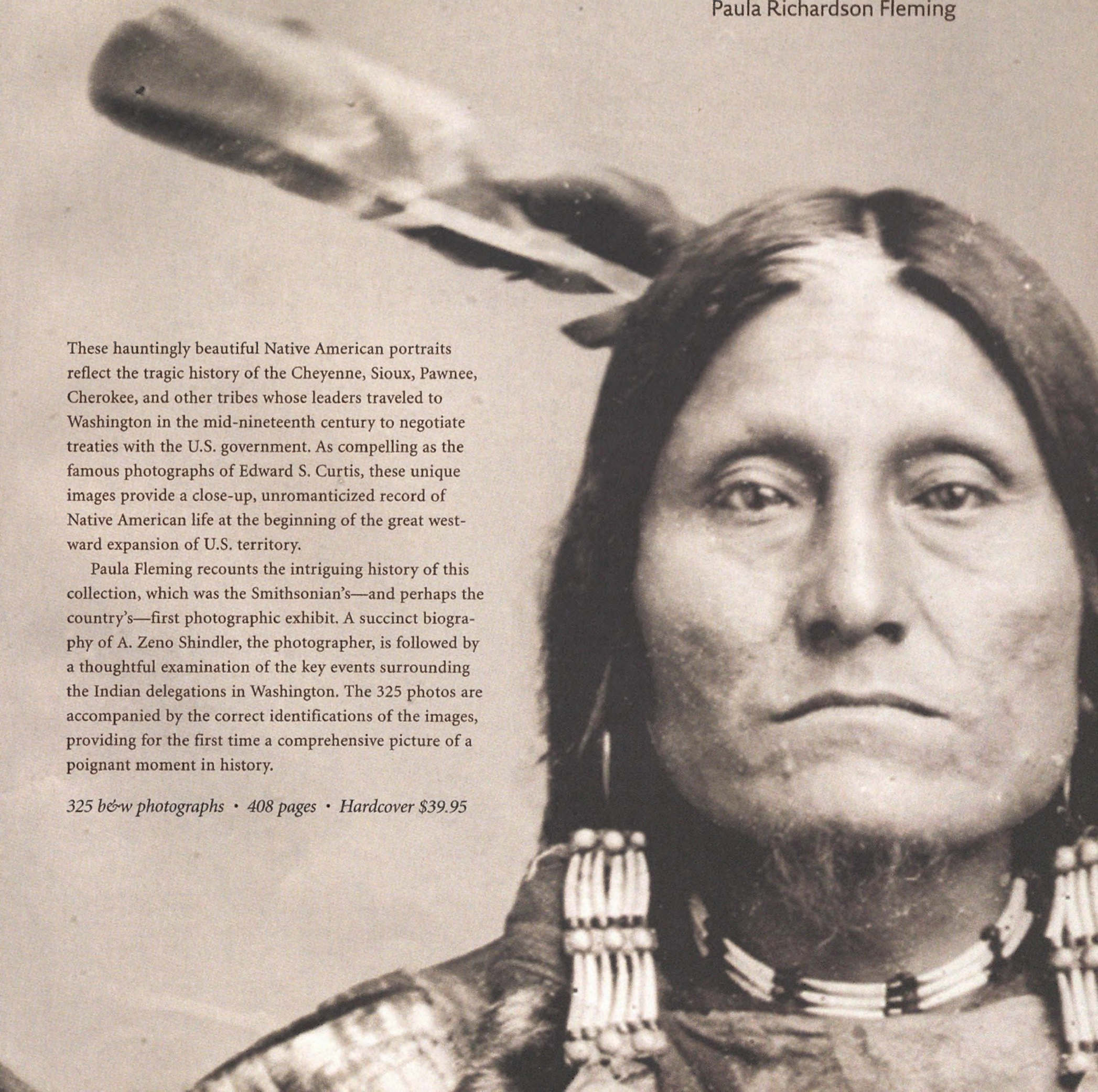
Native American Photography at the Smithsonian

The Shindler Catalogue

Paula Richardson Fleming



These hauntingly beautiful Native American portraits reflect the tragic history of the Cheyenne, Sioux, Pawnee, Cherokee, and other tribes whose leaders traveled to Washington in the mid-nineteenth century to negotiate treaties with the U.S. government. As compelling as the famous photographs of Edward S. Curtis, these unique images provide a close-up, unromanticized record of Native American life at the beginning of the great westward expansion of U.S. territory.

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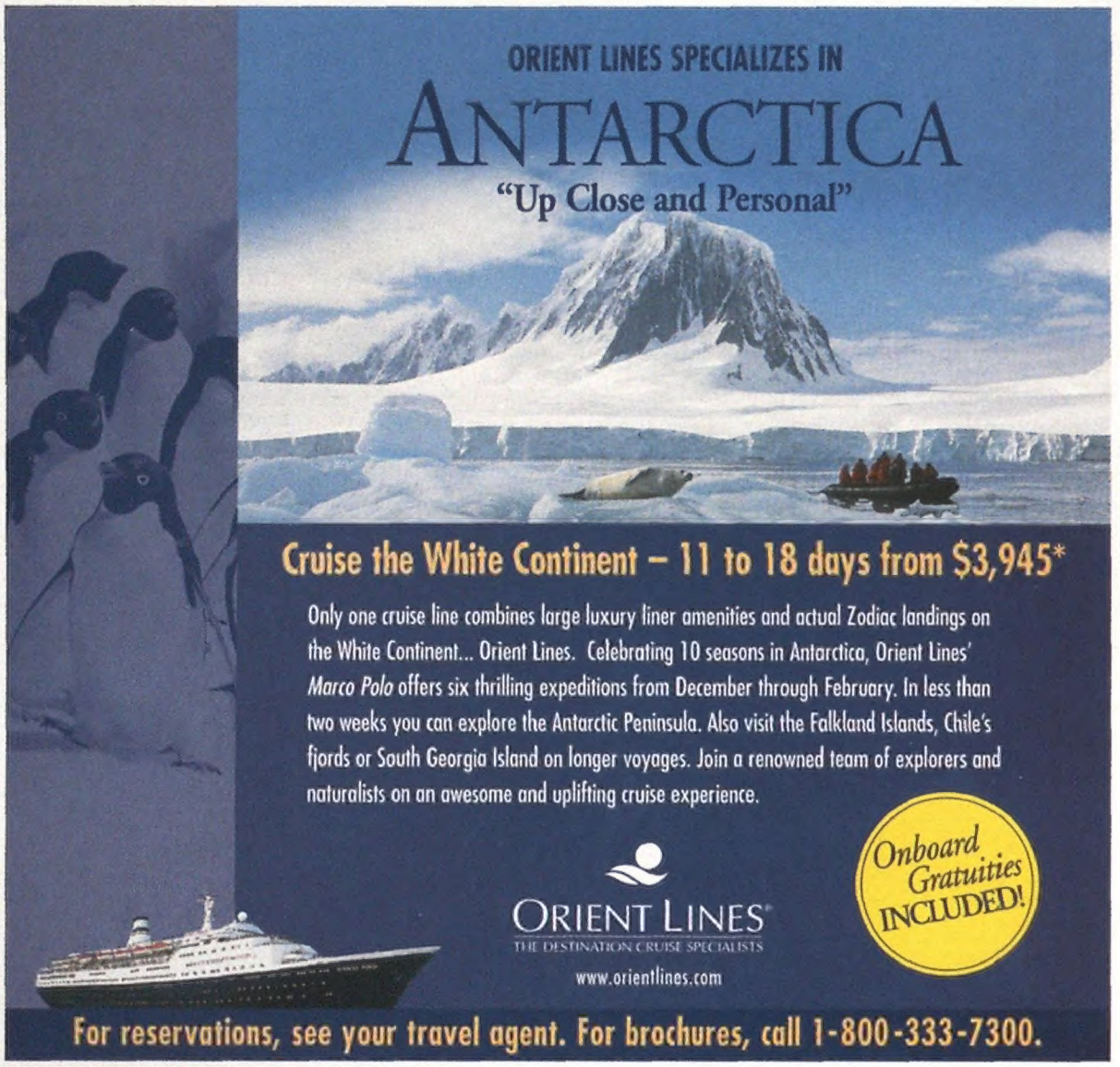
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Matters of Time

Everything old is news again

BY CAREY WINFREY

Roberts: Chicken?

FOR DAVID ROBERTS, who writes about why the ancient Anasazi people of the American West abandoned their cliffside dwellings some 700 years ago ("Riddles of the Anasazi," p. 72), one of the more intriguing ruins was one he failed to reach. "The only approach," he notes, "was by traversing a six-inch ledge above an 80-foot void. I chickened out, but Greg Child and Renée Globis, who were in tip-top shape, made the crossing. At the narrowest point on the ledge, they stepped in three footholds carved by the ancients. Reaching the ruin, they were astounded to find a huge kiva—an underground chamber—with a brilliantly painted interior, bins for grinding corn, and two big shield symbols painted on the wall." Says Roberts, "After they came down, Greg said, 'I can imagine the Anasazi performing that tiptoe traverse. But how in the world did they get all that stuff up there? You wouldn't have caught me dead on that six-inch ledge passing roof beams and building blocks to some dude standing three feet to my right.'"

Hall: Naked lunch.

STEPHEN S. HALL DIDN'T GASP, but he did wonder what he'd gotten himself into. Hall, who wrote our story about West Nile disease ("On the Trail of the West Nile Virus," p. 88), once profiled the late Notre Dame biologist George Craig, one of the grand old men of vector biology. "He asked me if I would join him for lunch," Hall recalls, "which of course I immediately agreed to do." Not only did Craig bring out some sandwiches, he also brought to his desk several laboratory containers covered with coarse nylon netting. These were filled with hungry mosquitoes, and while scientist and journalist ate lunch, they draped their arms over the tops of the containers so the mosquitoes could also dine. "Craig was a wonderful character," says Hall, "and if he were still alive today, he would be shaking his finger and saying, 'I told you so,' about the spread of West Nile. He firmly believed that more mosquito-borne diseases were destined to arrive on our shores and that we would be unprepared for them."

Rybczynski: Ever new.

WHEN WITOLD RYBCZYNSKI wrote *A Clearing in the Distance*, a biography of Frederick Law Olmsted, who designed New York City's Central Park 150 years ago, Rybczynski, himself an architect, was primarily concerned with the park as a mid-19th-century artifact. But looking at photographs of it taken over the years for "Olmsted's Triumph," p. 82, reminded him that "while Central Park is a historical place, it is also always new," he says. "Each generation has embraced the park and made it its own." ○

GREG CHILD; NANCY CRAMPTON; ISAK TINER

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Lighthouse of the Skies

The Smithsonian Astrophysical Observatory probes the universe for the unimaginable

THE LARGEST BUDGET in the Smithsonian belongs not to any museum but to one of our research centers, the Smithsonian Astrophysical Observatory (SAO). As far back as 1838, when the disposition of the bequest that would establish the Smithsonian was still a matter of debate, John Quincy Adams proposed that the money be used for an astronomical observatory—"a lighthouse of the skies." A different sort of Smithsonian emerged from that early debate, but the Institution did make room eventually for Adams' celestial lighthouse. In 1890, Secretary Samuel Langley, an astronomer and a pioneer of flight, founded SAO, which today is one of the glories of the Smithsonian. It embodies an aspect of the Institution that's less visible to the public than our museums but that's no less essential to our mission: to probe the deepest secrets of nature through basic scientific research.

Since 1973, SAO has been a partner with Harvard University in the Harvard-Smithsonian Center for Astrophysics, an enterprise involving some 900 researchers, staff and students. Their work reflects the separate but linked contributions of astronomy and physics to the study of the universe. The first task is to observe how the universe behaves, using instruments fixed to Earth (telescopes at facilities in Arizona, Chile, Hawaii, Massachusetts and at the South Pole) and in orbit aloft (including the Chandra X-Ray Observatory, conceived at SAO and launched by NASA in July 1999). Researchers then set about making models—formulating theories—to explain the observed behavior. As technology advances, more powerful instruments are built, disclosing new information requiring better models, in a never-ending sequence.

Until 1998, SAO used a multiple-mirror telescope in Arizona that had six 1.6-meter mirrors. When technology allowed, the six mirrors were replaced with one mirror 6.5 meters in diameter; it provides a field of view nearly 400 times larger than could be achieved with the previous instrument. Now SAO is involved in plans for a 20-meter telescope, which will extend our reach and enable us to view events such as the birth of the first galaxy many billions of years ago. But not all the benefits of SAO's work are at a distance: a recently developed capacity to stop light, store it, and then—the significant part—re-create it with all its properties intact, may one day transform how computers operate.

Because SAO encompasses so generous a range of subfields of astrophysics, it brings unsurpassed breadth to the study of the universe. It has the resources, human and technological, to observe objects and phenomena along the entire electromagnetic spectrum, from long radio waves to ultra-short gamma rays. Among the observatory's great achievements, let me cite just three: the discovery, through optical telescopes, that galaxies are not distributed randomly in space but mostly form enormous sheets and bubbles; the discovery, using radio observations, of supermassive black holes; and the shocking discovery (made simultaneously by scientists at UC Berkeley) that the universe is accelerating in its expansion. A model to account for the acceleration? Scientists haven't a clue. Not yet.

SAO antennas in Hawaii observe celestial objects at submillimeter wavelengths.

The distances, dimensions and temperatures of the cosmic objects studied at SAO are vastly beyond our ordinary experience of measurement. Thanks to the Chandra X-Ray Observatory, for example, we can hold in our hands images the size, shape and color of ordinary photographs that show, with unprecedented clarity, something astonishing: the Crab Nebula, the remnant of a supernova 6,000 light-years from Earth. The images are a wonder, but so, too, is the human mind responsible for them—a mind determined to conceive the inconceivable and imagine the unimaginable size and distance they portray. Human beings have always had good reason to be humbled when they look to the heavens, and a better reason not to be deterred.

Lawrence M. Small
SECRETARY OF THE SMITHSONIAN INSTITUTION

D. A. PETERSON; SMITHSONIAN ASTROPHYSICAL OBSERVATORY

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Readers respond to the May issue:

CASTRO'S NATURE

I AM APPALLED that "The Nature of Cuba" fawns over the ecological policies of one of the worst tyrannical rulers in the world today. Why are you so caring about frogs and birds and so indifferent to the welfare of the 11 million people in Castro's gulag? He recently had three people shot because they attempted to escape the island by hijacking a ferry. Eugene Linden's article does a disservice to the Cuban people and all those who are attempting to return democracy to Cuba through peaceful means. Cuba's environment may be unspoiled, but the Cuban people are virtually enslaved.

ARCHIBALD J. KIELLY
MANASSAS, VIRGINIA

WE HAVE LONG KNOWN about Cuba's great accomplishments in medicine and education; Cuba's high literacy rate and low infant mortality rate are among the most impressive in the world. Now we have evidence of another side of Cuba to be admired: the loving protection of the environment. It is ironic that the U.S. trade embargo probably contributed to the health of Cuba's plants, animals, wetlands, reefs and cloud forests. Let's hope the United States can learn something from its island neighbor to the south.

JOHN FRENCH BAUMEL
YONKERS, NEW YORK

LINDEN showcased the island nation's rich biological diversity and the need for present and future Cuban governments to manage, monitor and enforce environmental protection measures. As coauthor with Jorge Pérez-López of *Conquering Nature*, a book mentioned in the article, I would like to clarify two points. First, the record simply does not point to significant environmental planning in Cuba during the past four decades. In fact, the lack of environmental planning has had disastrous consequences, particularly as a result of

misguided agricultural policies. Second, our book analyzes the environmental consequences of development policies pursued under Cuba's socialist regime and is not a political commentary delving into whether Cuba's environment would have been better off with a different government.

SERGIO DÍAZ-BRIQUETS
COUNCIL FOR HUMAN DEVELOPMENT
ALEXANDRIA, VIRGINIA

EUGENE LINDEN REPLIES:
I don't recall elevating frogs over people, but I did stipulate the repressiveness of the Castro regime and the hardships Cubans endure. Cuba began taking the environment really seriously only about a dozen years ago, and its approach contravenes many conventional wisdoms about preserving nature. When democracy does come to Cuba, let's hope the trend continues.

IRAQ'S REGIMES

WHILE "Iraq's Unruly Century" informs readers of the British role in developing Iraq, the article omits what I feel is some crucial history: there are indications that the U.S. government helped bring the Baathist Party and Saddam Hussein to power when the C.I.A. tried to topple Qassem in 1963. In a parenthetical phrase, author Jonathan Kandell concedes an American role in the deadly eight-year war between Iraq and Iran—a conflict that took 700,000 to 800,000 lives. If we Americans are ever going to have a responsible foreign policy, we need to know that U.S. administrations for decades have backed despotic regimes in Iraq and around the globe. Ending such dictatorships causes enormous human suffering. The current "regime change" in Iraq has destroyed a country and cost thousands of lives.

MARGARET MCLAUGHLIN
MIAMI, FLORIDA

EMERSON'S PLATITUDES

AFTER ATTEMPTING for 40 years to cultivate an appreciation for Emerson ("Still Ahead of His Time"), I still see him as a purveyor of windy platitudes. None of his observations has any predictive or explanatory power; many verge on the unintelligible. At best Emerson's work might be considered Delphic "wisdom literature." To paint him as the precursor of a genuine scientist such as Darwin, as the author Frederick Turner suggests, demeans the amazing accomplishments of the true scientists of the 19th and early 20th centuries. While Turner's article was entertaining, its outlandish claims for the relevance of Emerson's work to science were simply ludicrous.

RALPH E. AVERY
ROCKVILLE, MARYLAND

FREDERICK TURNER REPLIES:
Many great scientists are generous about their intuitive intellectual predecessors, whether they be poets, philosophers or artists. Scientists work up their hypotheses from hints floating about them in the human medium. To assert that scientific discovery has no cultural context or evolutionary roots in earlier thoughts is to see science as some sort of creationist miracle.

Send letters to LettersEd@simag.si.edu or to **Letters, Smithsonian, MRC 951, P.O. Box 37012, Washington, D.C. 20013.** Please include a telephone number and address. Letters may be edited. Because of the high volume of mail we receive, we cannot guarantee a response to all letters. Send queries about the Smithsonian Institution to info@si.edu or to VIARC, Public Inquiry Mail Service, P.O. Box 37012, Washington, D.C. 20013.

SMITHSONIAN (MAY 2003) (2)

I've got something that works, and I'm staying with it. And I've got lots of company.

In over 10 years, more than 140 million prescriptions have been filled for the cholesterol-lowering medication ZOCOR. I've been taking ZOCOR ever since I had a heart attack. My doctor told me that along with a healthy diet and exercise, ZOCOR could lower my cholesterol, which is what I really needed to do. I've always felt good knowing ZOCOR is a time-tested medication. You should too. And my cholesterol? ZOCOR really got it down.

ZOCOR is an effective medicine that along with diet and exercise can significantly lower total cholesterol. A clinical study among people with high cholesterol and heart disease found 42% fewer deaths from heart attack among those taking ZOCOR.* One tablet, taken once a day, can help people with high cholesterol and heart disease live a longer, healthier life.

Important considerations: ZOCOR is a prescription medicine and isn't right for everyone, including women who are nursing or pregnant or who may become pregnant, anyone with liver problems, and people who are allergic to any ingredients of ZOCOR. Unexplained muscle pain or weakness could be a sign of a rare but serious side effect and should be reported to your doctor right away. Your doctor may do blood tests before and during treatment with ZOCOR to check for liver problems. To avoid serious side effects, discuss with your doctor medicine or food you should avoid while on ZOCOR (see details immediately following this ad).

When diet and exercise are not enough, ask your doctor if ZOCOR is right for you. For more information and the FREE *Guide for Managing High Cholesterol*, call 1-800-MERCK-75 or visit *zocor.com*.

YOUR RESULTS MAY VARY.

PLEASE READ THE MORE DETAILED INFORMATION ABOUT ZOCOR IMMEDIATELY FOLLOWING THIS AD.

*42% reduction based on 111/2,221 (ZOCOR) vs 189/2,223 (placebo).

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ZOCOR (SIMVASTATIN)

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ZOCOR®
(SIMVASTATIN)

PLEASE READ THIS SUMMARY CAREFULLY, AND THEN ASK YOUR DOCTOR ABOUT ZOCOR. NO ADVERTISEMENT CAN PROVIDE ALL THE INFORMATION NEEDED TO PRESCRIBE A DRUG. THIS ADVERTISEMENT DOES NOT TAKE THE PLACE OF CAREFUL DISCUSSIONS WITH YOUR DOCTOR. ONLY YOUR DOCTOR HAS THE TRAINING TO WEIGH THE RISKS AND BENEFITS OF A PRESCRIPTION DRUG FOR YOU.

USES OF ZOCOR

ZOCOR is a prescription drug that is indicated as an addition to diet for many patients with high cholesterol when diet and exercise are inadequate. For patients with coronary heart disease (CHD) and high cholesterol, ZOCOR is indicated as an addition to diet to reduce the risk of death by reducing coronary death; to reduce the risk of heart attack; to reduce the risk for undergoing cardiac procedures (coronary artery bypass grafting and percutaneous transluminal coronary angioplasty); and to reduce the risk of stroke or transient ischemic attack (TIA).

WHEN ZOCOR SHOULD NOT BE USED

Some people should not take ZOCOR. Discuss this with your doctor.

ZOCOR should not be used by patients who are allergic to any of its ingredients. In addition to the active ingredient simvastatin, each tablet contains the following inactive ingredients: cellulose, lactose, magnesium stearate, iron oxides, talc, titanium dioxide, and starch. Butylated hydroxyanisole is added as a preservative.

Patients with liver problems: ZOCOR should not be used by patients with active liver disease or repeated blood test results indicating possible liver problems. (See WARNINGS.)

Women who are or may become pregnant: Pregnant women should not take ZOCOR because it may harm the fetus. **Women of childbearing age should not take ZOCOR unless it is highly unlikely that they will become pregnant.** If a woman does become pregnant while on ZOCOR, she should stop taking the drug and talk to her doctor at once.

Women who are breast-feeding should not take ZOCOR.

WARNINGS

Muscle: Tell your doctor right away if you experience any unexplained muscle pain, tenderness, or weakness at any time during treatment with ZOCOR so your doctor can decide if ZOCOR should be stopped. Some patients may have muscle pain or weakness while taking ZOCOR. Rarely, this can include muscle breakdown resulting in kidney damage. The risk of muscle breakdown is greater in patients taking certain other drugs along with ZOCOR:

- **Cyclosporine, itraconazole, ketoconazole, erythromycin, clarithromycin, HIV protease inhibitors, the antidepressant nefazodone, or large quantities of grapefruit juice (>1 quart daily), particularly with higher doses of ZOCOR.**
- **Gemfibrozil, other fibrates, or lipid-lowering doses (≥1 g/day) of niacin, particularly with higher doses of ZOCOR.**
- **Amiodarone or verapamil with higher doses of ZOCOR.**

The risk of muscle breakdown is greater at higher doses of simvastatin.

Because the risk of muscle side effects is greater when ZOCOR is used with the products listed above, the combined use of these products should be avoided unless your doctor determines the benefits are likely to outweigh the increased risks.

If your doctor determines that the benefits of combined use of ZOCOR with gemfibrozil, other fibrates, or niacin likely outweigh the increased risk of muscle problems, the dose of ZOCOR should not exceed 10 mg daily. No more than 10 mg/day of ZOCOR should be taken with cyclosporine.

The combined use of verapamil or amiodarone with doses above ZOCOR 20 mg should be avoided unless your doctor determines the benefits outweigh the increased risk of muscle breakdown.

Your doctor should also carefully monitor for any muscle pain, tenderness, or weakness, particularly during the initial months of therapy and if the dose of either drug is increased. Your doctor also may monitor the level of certain muscle enzymes in your body, but there is no assurance that such monitoring will prevent the occurrence of severe muscle disease.

The risk of muscle breakdown is greater in patients with kidney problems or diabetes.

If you have conditions that can increase your risk of muscle breakdown, which in turn can cause kidney damage, your doctor should temporarily withhold or stop ZOCOR. Also, since there are no known adverse consequences of briefly stopping therapy with ZOCOR, treatment should be stopped a few days before elective major surgery and when any major acute medical or surgical condition occurs. Discuss this with your doctor, who can explain these conditions to you.

Liver: About 1% of patients who took ZOCOR in clinical trials developed elevated levels of some liver enzymes. Patients who had these increases usually had no symptoms. Elevated liver enzymes usually returned to normal levels when therapy with ZOCOR was stopped.

In the ZOCOR Survival Study, the number of patients with more than 1 liver enzyme level elevation to greater than 3 times the normal upper limit was no different between the ZOCOR and placebo groups. Only 8 patients on ZOCOR and 5 on placebo discontinued therapy due to elevated liver enzyme levels. Patients were started on 20 mg of ZOCOR, and one third had their dose raised to 40 mg.

Your doctor should perform routine blood tests to check these enzymes before you start treatment with ZOCOR and periodically thereafter (for example, semiannually) for your first year of treatment or until 1 year after your last elevation in dose. Patients titrated to the 80-mg dose should receive an additional test at 3 months. If your enzyme levels increase, your doctor should order more frequent tests. If your liver enzyme levels remain unusually high, your doctor should discontinue your medication.

Tell your doctor about any liver disease you may have had in the past and about how much alcohol you consume. ZOCOR should be used with caution in patients who consume large amounts of alcohol.

PRECAUTIONS

Before starting treatment with ZOCOR, try to lower your cholesterol by other methods such as diet, exercise, and weight loss. Ask your doctor about how best to do this. Any other medical problems that can cause high cholesterol should also be treated.

Drug Interactions: Because of possible serious drug interactions, it is important to tell your doctor what other drugs you are taking, including those obtained without a prescription. You should also tell other doctors who are prescribing a new medicine for you that you are taking ZOCOR® (simvastatin).

ZOCOR can interact with the following:

- Itraconazole
- Ketoconazole
- Erythromycin
- Clarithromycin
- HIV protease inhibitors
- Nefazodone
- Cyclosporine
- Large quantities of grapefruit juice (>1 quart daily)

The risk of myopathy is also increased by the following lipid-lowering drugs that can cause myopathy when given alone:

- Gemfibrozil
- Other fibrates
- Niacin (nicotinic acid) (≥1 g/day)

The risk of muscle breakdown is increased with other drugs:

- Amiodarone
- Verapamil

Some patients taking lipid-lowering agents similar to ZOCOR and coumarin anticoagulants (a type of blood thinner) have experienced bleeding and/or increased blood clotting time. Patients taking these medicines should have their blood tested before starting therapy with ZOCOR and should continue to be monitored.

Central Nervous System Toxicity; Cancer, Mutations, Impairment of Fertility: Like most prescription drugs, ZOCOR was required to be tested on animals before it was marketed for human use. Often these tests were designed to achieve higher drug concentrations than humans achieve at recommended dosing. In some tests, the animals had damage to the nerves in the central nervous system. In studies of mice with high doses of ZOCOR, the likelihood of certain types of cancerous tumors increased. No evidence of mutations of or damage to genetic material has been seen. In 1 study with ZOCOR, there was decreased fertility in male rats.

Pregnancy: Pregnant women should not take ZOCOR because it may harm the fetus.

Safety in pregnancy has not been established. In studies with lipid-lowering agents similar to ZOCOR, there have been rare reports of birth defects of the skeleton and digestive system. Therefore, women of childbearing age should not take ZOCOR unless it is highly unlikely they will become pregnant. If a woman does become pregnant while taking ZOCOR, she should stop taking the drug and talk to her doctor at once. The active ingredient of ZOCOR did not cause birth defects in rats at 3 times the human dose or in rabbits at 3 times the human dose.

Nursing Mothers: Drugs taken by nursing mothers may be present in their breast milk. Because of the potential for serious adverse reactions in nursing infants, a woman taking ZOCOR should not breast-feed. (See WHEN ZOCOR SHOULD NOT BE USED.)

Pediatric Use: ZOCOR is not recommended for children or patients under 20 years of age.

Geriatric Use: Higher blood levels of active drug were seen in elderly patients (70–78 years of age) compared with younger patients (18–30 years of age) in 1 study. In other studies, the cholesterol-lowering effects of ZOCOR were at least as great in elderly patients as in younger patients, and there were no overall differences in safety between elderly and younger patients over the 20–80 mg/day dosage range.

SIDE EFFECTS

Most patients tolerate treatment with ZOCOR well; however, like all prescription drugs, ZOCOR can cause side effects, and some of them can be serious. Side effects that do occur are usually mild and short-lived. Only your doctor can weigh the risks versus the benefits of any prescription drug. In clinical studies with ZOCOR, less than 1.5% of patients dropped out of the studies because of side effects. In a large, long-term study, patients taking ZOCOR experienced similar side effects to those patients taking placebo (sugar pills). Some of the side effects that have been reported with ZOCOR or related drugs are listed below. This list is not complete. Be sure to ask your doctor about side effects before taking ZOCOR and to discuss any side effects that occur.

Digestive System: Constipation, diarrhea, upset stomach, gas, heartburn, stomach pain/cramps, anorexia, loss of appetite, nausea, inflammation of the pancreas, hepatitis, jaundice, fatty changes in the liver, and, rarely, severe liver damage and failure, cirrhosis, and liver cancer.

Muscle, Skeletal: Muscle cramps, aches, pain, and weakness; joint pain; muscle breakdown.

Nervous System: Dizziness, headache, insomnia, tingling, memory loss, damage to nerves causing weakness and/or loss of sensation and/or abnormal sensations, anxiety, depression, tremor, loss of balance, psychic disturbances.

Skin: Rash, itching, hair loss, dryness, nodules, discoloration.

Eye/Senses: Blurred vision, altered taste sensation, progression of cataracts, eye muscle weakness.

Hypersensitivity (Allergic) Reactions: On rare occasions, a wide variety of symptoms have been reported to occur either alone or together in groups (referred to as a syndrome) that appeared to be based on allergic-type reactions, which may rarely be fatal. These have included 1 or more of the following: a severe generalized reaction that may include shortness of breath, wheezing, digestive symptoms, and low blood pressure and even shock; an allergic reaction with swelling of the face, lips, tongue, and/or throat with difficulty swallowing or breathing; symptoms mimicking lupus (a disorder in which a person's immune system may attack parts of his or her own body); severe muscle and blood vessel inflammation, sometimes including rash; bruises; various disorders of blood cells (that could result in anemia, infection, or blood clotting problems) or abnormal blood tests; inflamed or painful joints; hives; fatigue and weakness; sensitivity to sunlight; fever, chills; flushing; difficulty breathing; and severe skin disorders that vary from rash to a serious burn-like shedding of skin all over the body, including mucous membranes such as the lining of the mouth.

Other: Loss of sexual desire, breast enlargement, impotence.

Laboratory Tests: Liver function test abnormalities including elevated alkaline phosphatase and bilirubin; thyroid function abnormalities.

NOTE: This summary provides important information about ZOCOR. If you would like more information, ask your doctor or pharmacist to let you read the prescribing information and then discuss it with them.

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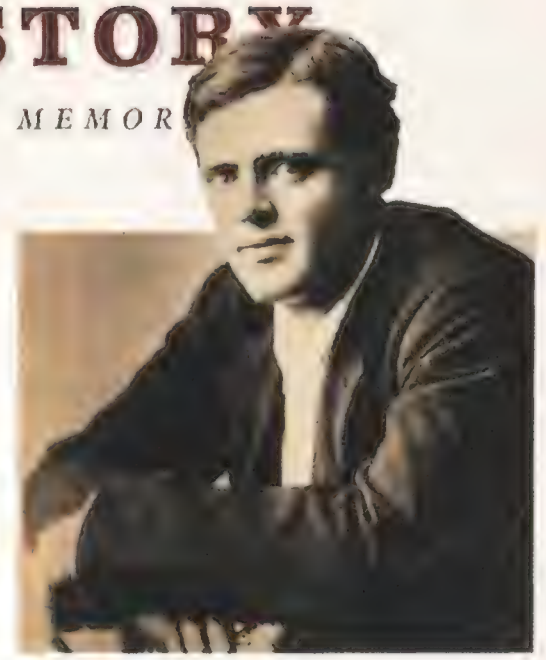
THIS MONTH IN HISTORY

JULY ANNIVERSARIES—MOMENTOUS OR MERELY MEMOR

150 YEARS AGO: WEST MEETS EAST Navy commander Matthew Perry, bearing letters from President Millard Fillmore to the Japanese emperor, sails the USS *Susquehanna* into Edo (now Tokyo) Bay, challenging Japan's isolationist policy. The U.S. seeks trade and Japanese coal to fuel American steamships plying Asian waters. Perry's forceful foray leads to a U.S.-Japanese treaty and marks the beginning of Japan's modernization.

70 YEARS AGO: FLYING SOLO On July 22, 1933, one-eyed Wiley Post, 35, completes the first solo round-the-world flight when he returns to Brooklyn, New York, in his Lockheed Vega. His 7-day, 18-hour and 49-minute flight sets a speed record and, says the *New York Times*, "ushers in a new stage of long distance aviation." It also proves the value of a new technology—the autopilot.



100 YEARS AGO: CALL OF THE ADVENTURE NOVEL Jack London, 27, achieves overnight celebrity with his third novel, *The Call of the Wild*, the tale of a beloved pet dog's transformation into a noble savage in the Klondike. A reviewer lauds the now-classic study of the "beastly manners of civilised men and the civilised manners of beasts." The first edition sells out in a day.

40 YEARS AGO: ZIPPITY DO DAH With handwritten letters giving way to mountains of automated mailings, the U.S. Post Office Department implements five-digit Zoning Improvement Plan (ZIP) Codes to enable mechanized mail handling. More mail is indeed processed faster—today the USPS delivers some 200 billion pieces annually—though a lot of it, alas, is junk.

25 YEARS AGO: MAKING BABY Louise Joy Brown, the first "test-tube" baby, is born July 25, 1978, in England. Conceived outside her mother's body by in vitro fertilization (IVF), developed by Patrick Steptoe and Robert Edwards, her widely publicized birth prompts a heated ethical debate. But the procedure offers hope to infertile couples, and between 1978 and 2003 hundreds of thousands of IVF babies will be born worldwide. Louise Brown announces her engagement in April 2003.

150 YEARS AGO: SNACK JUDGMENT What leads a chef in Saratoga Springs, New York, to fry thin-sliced potatoes until they're crisp? Some say George Crum was taking revenge on a diner who complained about underdone spuds. Others say his sister Kate accidentally dropped a tater slice in oil. Either way, the potato chip is born, and the rest is culinary history—and a $6 billion industry.

—*ALISON MCLEAN*

CLOCKWISE FROM TOP LEFT: MATHEW BRADY / CORBIS; AP / WIDE WORLD PHOTOS; UNDERWOOD & UNDERWOOD / CORBIS; AP / WIDE WORLD PHOTOS; BECKY LUIGART-STAYNER / CORBIS; NATIONAL POSTAL MUSEUM

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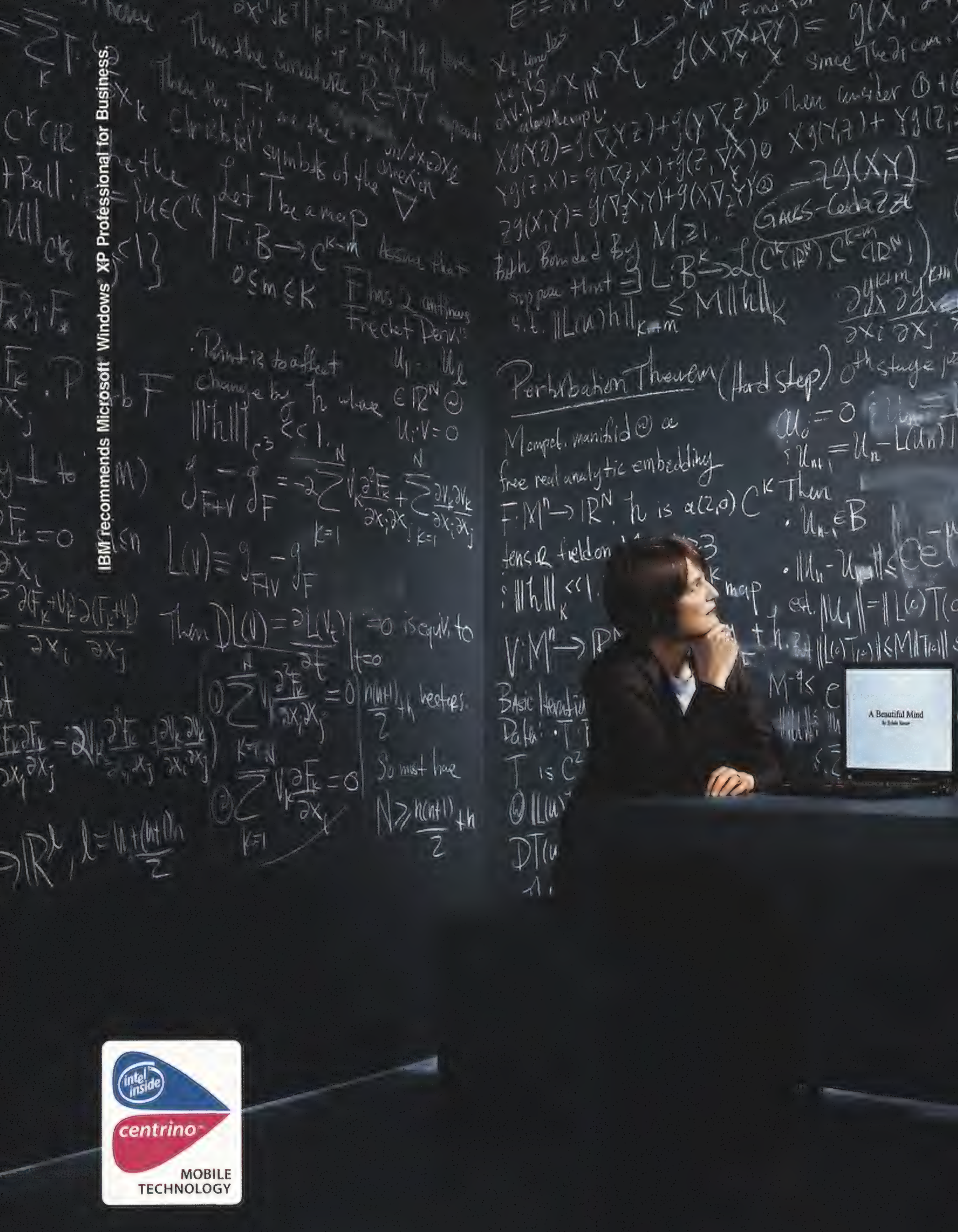

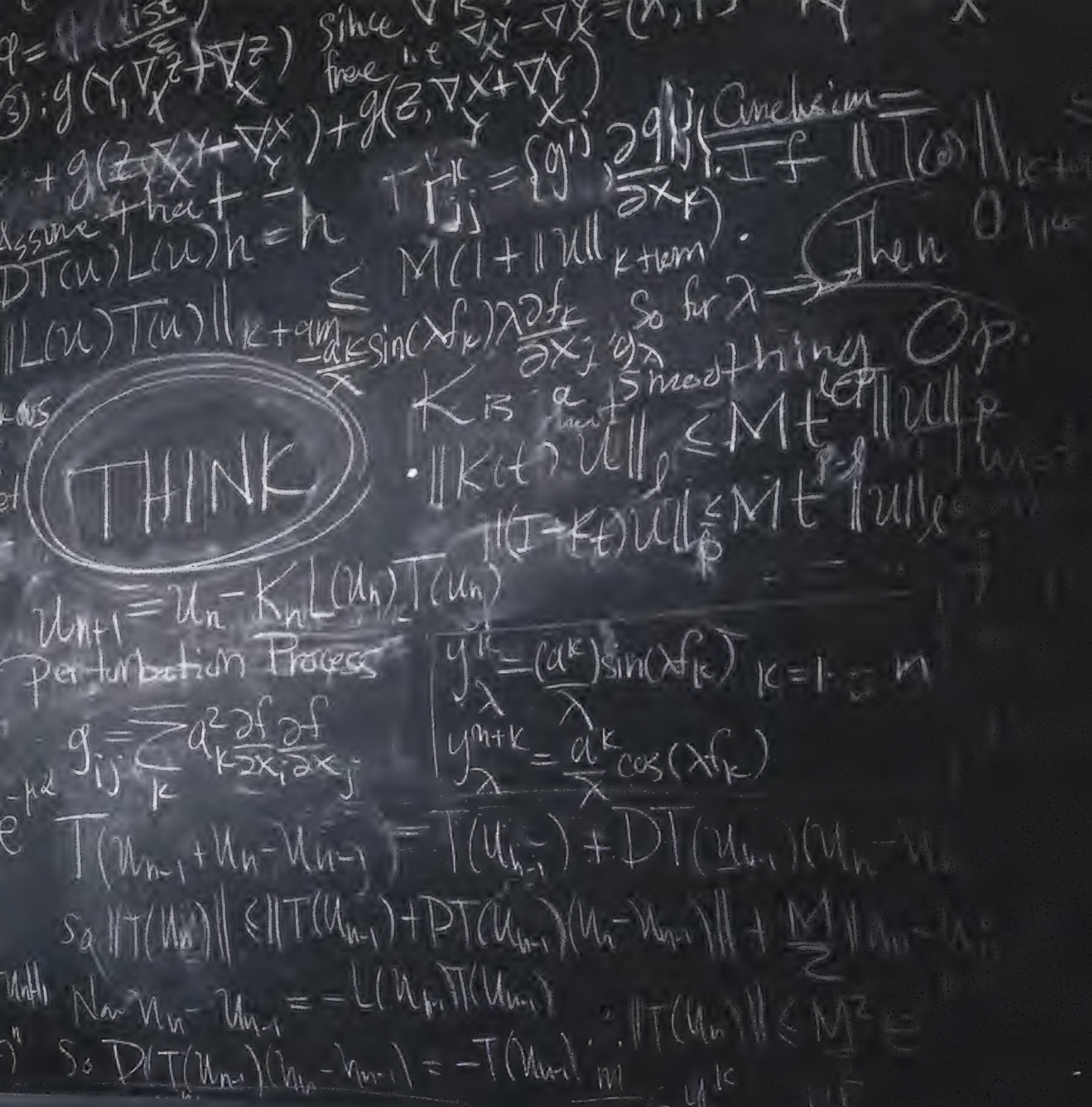

SYLVIA NASAR
Economist and
Author of A Beautiful Mind,
WITH THE NEW
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Always the gentleman, Charles Willis opens the car door for his wife.

Even when she's 250 miles away.

Charles always opens the car door for his wife. Not just when it's convenient. Not every once in a while. Always. So when his wife locked her keys in the car when she was 250 miles away, that did not stop Charles. He simply called OnStar® and they sent a signal to unlock her doors, proving once again that chivalry is indeed not dead. Anything can happen on the road and when it does, it's nice to know there's OnStar. Twenty-four hours a day, a live Advisor can help you with virtually any situation, from unlocking your door to calling for help in an emergency. To learn how OnStar can be there for you in your next vehicle, visit your dealer or log on to onstar.com. If you're already an OnStar subscriber, it's easy to maintain the safety and security you already count on for only $16.95* a month. Simply press the blue OnStar button and tell the Advisor you'd like to renew.

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For many of these revelers at the Waldorf-Astoria in Manhattan in 1940, things will never be better than they are on this night.

Ruling the Roost

Before the advent of factory farms and supermarkets, the self-made kings of New York City's butter and egg trade lived extra large – BY MICHAEL SHAPIRO

THE MEN IN THIS PICTURE are butter and egg men. They liked to joke that their wives were fat because they buttered their toast on both sides. Such was the reputation of butter and egg men, who were wealthy but regarded as a bit crude. Old money they were not.

This party is a celebration of the lives these men had made for themselves in America. It was held the night of January 20, 1940, at the Waldorf-Astoria Hotel in Manhattan. It feels like a glamorous moment, but they are not glamorous men. They are, by and large, men who worked very long and very hard selling as much butter and as many eggs as they could. They were, for the most part, men who had come to America from someplace else and who made their way to the west side of lower Manhattan, to present-day TriBeCa, which in their time was the city's butter and egg market. What the people in this photograph do not know is that, for most of them, things will never be better than they are on this night.

My maternal grandfather, Harry Ackerman, is the third man from the right in the front row of those standing—the short man with the round face. He is 43 and stands directly behind my grandmother. His eldest son, Herbert, is behind him. Herbert is 19 and my grandfather is preparing him to be a butter and egg man so that the sign on his store will one day read Harry Ackerman and Sons. But Herbert does not much want to be a butter and egg man.

The butter and egg men were members of the New York Mercantile Exchange. Every weekday morning they left their stores and walked around the corner to the redbrick exchange building where at 10:30 precisely they performed the ritual of setting the price of eggs for the nation. Then they walked back to their stores, along impossibly narrow streets crowded with trucks and with men doing the lifting and hauling that many of the wealthy butter and egg men had themselves done when they had first come to the trade. Their stores were narrow and deep and generally filled with little more than a desk, a phone, tubs of butter and thousands of eggs. They

The eggs came by truck if they were "nearbys," by train if from the Midwest.

New York's egg and produce markets (in 1942, at midnight) bustled night and day.

spent their days selling to restaurants, stores, ocean liners, each other and, for a while anyway, that newest form of retailing, the supermarkets.

The eggs came by truck if they were "nearbys"—New Jersey, Pennsylvania, upstate New York—and by train if from the Midwest. Butter and egg men sometimes traveled west to meet with the farmers with whom they did business and to whom they might one day send their sons to learn the poultry and dairy trades. The sons learned to candle—holding an egg up to a candle to determine its quality. And if their sons could not candle, say, six eggs at once the way the experienced candlers could, that was of little concern. Their sons were not going to be candlers. Their sons were going to be *rich*.

There was money to be made in eggs from untapped sources, like Utah, where a friend of my grandfather's discovered the poultry equivalent of Córdoba, a land awash in eggs of marvelous quality, packaged lovingly by farmers who organized themselves into a cooperative that was, by 1940, shipping trainloads of eggs to New York City.

The party captured in this photograph celebrated the prosperity that would be shared by the Utah Poultry Producers and New York's butter and egg men. My grandfather helped arrange the party. He loved parties. To him, a grand party epitomized the life he had created for himself, a life that must have looked impossible to him years earlier when, as a fatherless 17-year-old, he emigrated from the Jewish Pale of Settlement in Poland and entered the trade because his older brother was already selling eggs in New York City.

My grandfather reinvented himself in America as a butter and egg man. He looked at the successful men who had come before him and learned not only how to make a good business but how to dress and where to shop—Rogers Peet, & Company, on Broadway. He learned that the best parties were in the best hotels, like the Waldorf.

What my grandfather does not know, not on this night, is that within a year his son Herbert will be in the Army and that his second son, Arthur, will soon follow. And while my uncles would come home at the end of World War II, they returned to a world much different from the one that my grandfather hoped they might inherit. Herbert Weinberger, the son of another butter and egg man (and no relation to my uncle Herbert), would later recall driving around Long Island one day and seeing a sight that convinced him he had no future as a butter and egg man.

Every mile or so, it seemed, he saw a sign heralding the coming of a new supermarket for the people flocking to the new homes on the island. The supermarkets did not need the butter and egg men—they got their eggs from a new kind of farm—nor would the bushel and basket farmers on the back roads of Indiana and Ohio. The farms that supplied the supermarkets were vast facilities, some with a million chickens, whose eggs the new industrial farmers sold directly to the supermarkets.

Herbert Weinberger also recalled how the older butter and egg men did not heed his warnings about how the business was changing; men had prospered in the traditional ways since the mid-19th century, the older men said. So Herbert quit to become a commodities trader. By the late 1960s, the butter and egg market was gone.

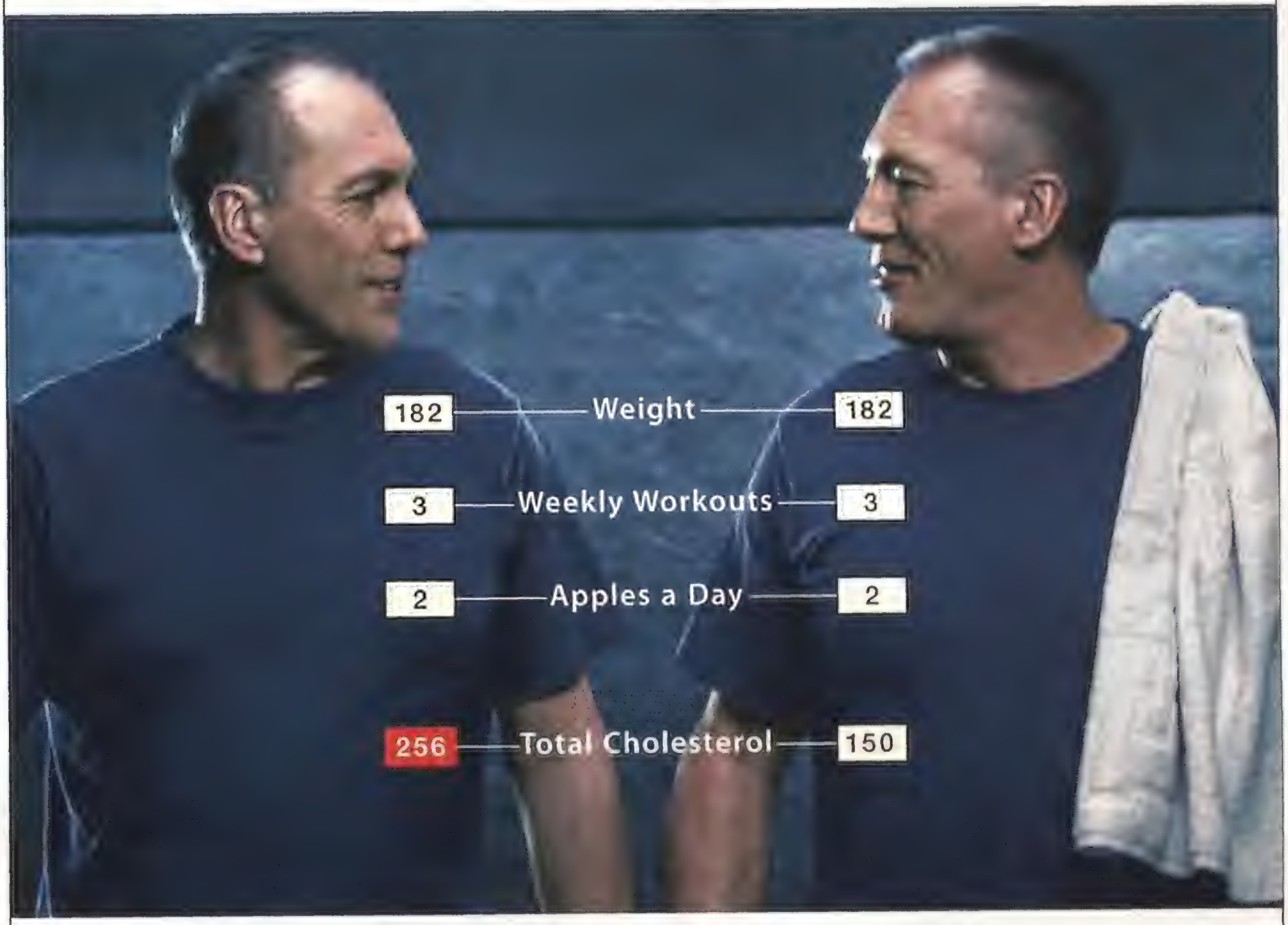
I do not know who took this picture. It hangs in my office, where I sometimes catch myself staring at it, rapt. In this picture Harry Ackerman is younger than I am now, his 50-year-old grandson, who gazes at him from time to time imagining the pleasure he is taking in this night.

My uncle Herbert became a social worker. My uncle Arthur, an accountant, took a position with the Internal Revenue Service and, after my grandfather died, moved his family into the big house in Brooklyn that my grandfather had bought for my grandmother many years before—a monument to what he had made of himself selling butter and eggs. ○

MICHAEL SHAPIRO's latest book is The Last Good Season, *about the 1956 pennant-winning Brooklyn Dodgers.*

HERBERT GEHR / TIME LIFE PICTURES / GETTY IMAGES

Two of a kind. Until one took Lipitor.



Important information:

LIPITOR® (atorvastatin calcium) is a prescription drug used with diet to lower cholesterol. LIPITOR is not for everyone, including those with liver disease or possible liver problems, women who are nursing, pregnant, or may become pregnant. LIPITOR has not been shown to prevent heart disease or heart attacks.

If you take LIPITOR, tell your doctor about any unusual muscle pain or weakness. This could be a sign of serious side effects. It is important to tell your doctor about any medications you are currently taking to avoid possible serious drug interactions. Your doctor may do simple blood tests to monitor liver function before and during drug treatment. The most commonly reported side effects are gas, constipation, stomach pain and indigestion. They are usually mild and tend to go away.

Here's something that might make you think twice. Even if you do the right things, you can still have high cholesterol. In fact, for 2 out of 3 adults with high cholesterol, diet and exercise may not lower it enough. The good news is that LIPITOR can lower your total cholesterol 29% to 45%.* It can lower your bad cholesterol 39% to 60%.* (*The average effect depends on the dose.) So talk to your doctor today to find out if LIPITOR is right for you. To learn more, call us at 1-888-LIPITOR or find us on the web at www.lipitor.com.

LIPITOR®
atorvastatin calcium
tablets

FOR CHOLESSTEROL®

Please see additional important information on next page.

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LIPITOR® (Atorvastatin Calcium) Tablets

Brief Summary of Prescribing Information

CONTRAINDICATIONS: Active liver disease or unexplained persistent elevations of serum transaminases. Hypersensitivity to any component of this medication. **Pregnancy and Lactation** — Atherosclerosis is a chronic process and discontinuation of lipid-lowering drugs during pregnancy should have little impact on the outcome of long-term therapy of primary hypercholesterolemia. Cholesterol and other products of cholesterol biosynthesis are essential components for fetal development (including synthesis of steroids and cell membranes). Since HMG-CoA reductase inhibitors decrease cholesterol synthesis and possibly the synthesis of other biologically active substances derived from cholesterol, they may cause fetal harm when administered to pregnant women. Therefore, HMG-CoA reductase inhibitors are contraindicated during pregnancy and in nursing mothers. ATORVASTATIN SHOULD BE ADMINISTERED TO WOMEN OF CHILDBEARING AGE ONLY WHEN SUCH PATIENTS ARE HIGHLY UNLIKELY TO CONCEIVE AND HAVE BEEN INFORMED OF THE POTENTIAL HAZARDS. If the patient becomes pregnant while taking this drug, therapy should be discontinued and the patient apprised of the potential hazard to the fetus.

WARNINGS: Liver Dysfunction — HMG-CoA reductase inhibitors, like some other lipid-lowering therapies, have been associated with biochemical abnormalities of liver function. **Persistent elevations (>3 times the upper limit of normal [ULN] occurring on 2 or more occasions) in serum transaminases occurred in 0.7% of patients who received atorvastatin in clinical trials. The incidence of these abnormalities was 0.2%, 0.2%, 0.6%, and 2.3% for 10, 20, 40, and 80 mg, respectively.** One patient in clinical trials developed jaundice. Increases in liver function tests (LFT) in other patients were not associated with jaundice or other clinical signs or symptoms. Upon dose reduction, drug interruption, or discontinuation, transaminase levels returned to or near pretreatment levels without sequelae. Eighteen of 30 patients with persistent LFT elevations continued treatment with a reduced dose of atorvastatin. **It is recommended that liver function tests be performed prior to and at 12 weeks following both the initiation of therapy and any elevation of dose, and periodically (eg, semiannually) thereafter.** Liver enzyme changes generally occur in the first 3 months of treatment with atorvastatin. Patients who develop increased transaminase levels should be monitored until the abnormalities resolve. Should an increase in ALT or AST of >3 times ULN persist, reduction of dose or withdrawal of atorvastatin is recommended. Atorvastatin should be used with caution in patients who consume substantial quantities of alcohol and/or have a history of liver disease. Active liver disease or unexplained persistent transaminase elevations are contraindications to the use of atorvastatin (see CONTRAINDICATIONS). **Skeletal Muscle — Rare cases of rhabdomyolysis with acute renal failure secondary to myoglobinuria have been reported with atorvastatin and with other drugs in this class.** Uncomplicated myalgia has been reported in atorvastatin-treated patients (see ADVERSE REACTIONS). Myopathy, defined as muscle aches or muscle weakness in conjunction with increases in creatine phosphokinase (CPK) values >10 times ULN, should be considered in any patient with diffuse myalgias, muscle tenderness or weakness, and/or marked elevation of CPK. Patients should be advised to report promptly unexplained muscle pain, tenderness or weakness, particularly if accompanied by malaise or fever. Atorvastatin therapy should be discontinued if markedly elevated CPK levels occur or myopathy is diagnosed or suspected. The risk of myopathy during treatment with drugs in this class is increased with concurrent administration of cyclosporine, fibric acid derivatives, erythromycin, niacin, or azole antifungals. Physicians considering combined therapy with atorvastatin and fibric acid derivatives, erythromycin, immunosuppressive drugs, azole antifungals, or lipid-lowering doses of niacin should carefully weigh the potential benefits and risks and should carefully monitor patients for any signs or symptoms of muscle pain, tenderness, or weakness, particularly during the initial months of therapy and during any periods of upward dosage titration of either drug. Periodic creatine phosphokinase (CPK) determinations may be considered in such situations, but there is no assurance that such monitoring will prevent the occurrence of severe myopathy. **Atorvastatin therapy should be temporarily withheld or discontinued in any patient with an acute, serious condition suggestive of a myopathy or having a risk factor predisposing to the development of renal failure secondary to rhabdomyolysis (eg, severe acute infection, hypotension, major surgery, trauma, severe metabolic, endocrine and electrolyte disorders, and uncontrolled seizures).**

PRECAUTIONS: General — Before instituting therapy with atorvastatin, an attempt should be made to control hypercholesterolemia with appropriate diet, exercise, and weight reduction in obese patients, and to treat other underlying medical problems (see INDICATIONS AND USAGE in full prescribing information). **Information for Patients** — Patients should be advised to report promptly unexplained muscle pain, tenderness, or weakness, particularly if accompanied by malaise or fever. **Drug Interactions** — The risk of myopathy during treatment with drugs of this class is increased with concurrent administration of cyclosporine, fibric acid derivatives, niacin (nicotinic acid), erythromycin, azole antifungals (see WARNINGS, Skeletal Muscle). ***Antacid:*** When atorvastatin and Maalox® TC suspension were coadministered, plasma concentrations of atorvastatin decreased approximately 35%. However, LDL-C reduction was not altered. ***Antipyrine:*** Because atorvastatin does not affect the pharmacokinetics of antipyrine, interactions with other drugs metabolized via the same cytochrome isozymes are not expected. ***Colestipol:*** Plasma concentrations of atorvastatin decreased approximately 25% when colestipol and atorvastatin were coadministered. However, LDL-C reduction was greater when atorvastatin and colestipol were coadministered than when either drug was given alone. ***Cimetidine:*** Atorvastatin plasma concentrations and LDL-C reduction were not altered by coadministration of cimetidine. ***Digoxin:*** When multiple doses of atorvastatin and digoxin were coadministered, steady-state plasma digoxin concentrations increased by approximately 20%. Patients taking digoxin should be monitored appropriately. ***Erythromycin:*** In healthy individuals, plasma concentrations of atorvastatin increased approximately 40% with coadministration of atorvastatin and erythromycin, a known inhibitor of cytochrome P450 3A4 (see WARNINGS, Skeletal Muscle). ***Oral Contraceptives:*** Coadministration of atorvastatin and an oral contraceptive increased AUC values for norethindrone and ethinyl estradiol by approximately 30% and 20%. These increases should be considered when selecting an oral contraceptive for a woman taking atorvastatin. ***Warfarin:*** Atorvastatin had no clinically significant effect on prothrombin time when administered to patients receiving chronic warfarin treatment. **Endocrine Function** — HMG-CoA reductase inhibitors interfere with cholesterol synthesis and theoretically might blunt adrenal and/or gonadal steroid production. Clinical studies have shown that atorvastatin does not reduce basal plasma cortisol concentration or impair adrenal reserve. The effects of HMG-CoA reductase inhibitors on male fertility have not been studied in adequate numbers of patients. The effects, if any, on the pituitary-gonadal axis in premenopausal women are unknown. Caution should be exercised if an HMG-CoA reductase inhibitor is administered concomitantly with drugs that may decrease the levels or activity of endogenous steroid hormones, such as ketoconazole, spironolactone, and cimetidine. **CNS Toxicity** — Brain hemorrhage was seen in a female dog treated for 3 months at 120 mg/kg/day. Brain hemorrhage and optic nerve vacuolation were seen in another female dog that was sacrificed in moribund condition after 11 weeks of escalating doses up to 280 mg/kg/day. The 120 mg/kg dose resulted in a systemic exposure approximately 16 times the human plasma area-under-the-curve (AUC, 0-24 hours) based on the maximum human dose of 80 mg/day. A single tonic convulsion was seen in each of 2 male dogs (one treated at 10 mg/kg/day and one at 120 mg/kg/day) in a 2-year study. No CNS lesions have been observed in mice after chronic treatment for up to 2 years at doses up to 400 mg/kg/day or in rats at doses up to 100 mg/kg/day. These doses were 6 to 11 times (mouse) and 8 to 16 times (rat) the human AUC (0-24) based on the maximum recommended human dose of 80 mg/day. CNS vascular lesions, characterized by perivascular hemorrhages, edema, and mononuclear cell infiltration of perivascular spaces, have been observed in dogs treated with other members of this class. A chemically similar drug in this class produced optic nerve degeneration (Wallerian degeneration of retinogeniculate fibers) in clinically normal dogs in a dose-dependent fashion at a dose that produced plasma drug levels about 30 times higher than the mean drug level in humans taking the highest recommended dose. **Carcinogenesis, Mutagenesis, Impairment of Fertility** — In a 2-year carcinogenicity study in rats at dose levels of 10, 30, and 100 mg/kg/day, 2 rare tumors were found in muscle in high-dose females: in one, there was a rhabdomyosarcoma and, in another, there was a fibrosarcoma. This dose represents a plasma AUC (0-24) value of approximately 16 times the mean human plasma drug exposure after an 80 mg oral dose. A 2-year carcinogenicity study in mice given 100, 200, or 400 mg/kg/day resulted in a significant increase in liver adenomas in high-dose males and liver carcinomas in high-dose females. These findings occurred at plasma AUC (0-24) values of approximately 6 times the mean human plasma drug exposure after an 80 mg oral dose. *In vitro*, atorvastatin was not mutagenic or clastogenic in the following tests with and without metabolic activation: the Ames test with *Salmonella typhimurium* and *Escherichia coli*, the HGPRT forward mutation assay in Chinese hamster lung cells, and the chromosomal aberration assay in Chinese hamster lung cells. Atorvastatin was negative in the *in vivo* mouse micronucleus test. Studies in rats performed at doses up to 175 mg/kg (15 times the human exposure) produced no changes in fertility. There was aplasia and aspermia in the epididymis of 2 of 10 rats treated with 100 mg/kg/day of atorvastatin for 3 months (16 times the human AUC at the 80 mg dose); testis weights were significantly lower at 30 and 100 mg/kg and epididymal weight was lower at 100 mg/kg. Male rats given 100 mg/kg/day for 11 weeks prior to mating had decreased sperm motility, spermatid head concentration, and increased abnormal sperm. Atorvastatin caused no adverse effects on semen parameters, or reproductive organ histopathology in dogs given doses of 10, 40, or 120 mg/kg for two years. **Pregnancy — Pregnancy Category X: See CONTRAINDICATIONS.** Safety in pregnant women has not been established. Atorvastatin crosses the rat placenta and reaches a level in fetal liver equivalent to that of maternal plasma. Atorvastatin was not teratogenic in rats at doses up to 300 mg/kg/day or in rabbits at doses up to 100 mg/kg/day. These doses resulted in multiples of about 30 times (rat) or 20 times (rabbit) the human exposure based on surface area (mg/m^2). In a study in rats given 20, 100, or 225 mg/kg/day, from gestation day 7 through to lactation day 21 (weaning), there was decreased pup survival at birth, neonate, weaning, and maturity in pups of mothers dosed with 225 mg/kg/day. Body weight was decreased on days 4 and 21 in pups of mothers dosed at 100 mg/kg/day; pup body weight was decreased at birth and at days 4, 21, and 91 at 225 mg/kg/day. Pup development was delayed (rotorod performance at 100 mg/kg/day and acoustic startle at 225 mg/kg/day; pinnae detachment and eye opening at 225 mg/kg/day). These doses correspond to 6 times (100 mg/kg) and 22 times (225 mg/kg) the human AUC at 80 mg/day. Rare reports of congenital anomalies have been received following intrauterine exposure to HMG-CoA reductase inhibitors. There has been one report of severe congenital bony deformity, tracheo-esophageal fistula, and anal atresia (VATER association) in a baby born to a woman who took lovastatin with dextroamphetamine sulfate during the first trimester of pregnancy. LIPITOR should be administered to women of child-bearing potential only when such patients are highly unlikely to conceive and have been informed of the potential hazards. If the woman becomes pregnant while taking LIPITOR, it should be discontinued and the patient advised again as to the potential hazards to the fetus. **Nursing Mothers** — Nursing rat pups had plasma and liver drug levels of 50% and 40%, respectively, of that in their mother's milk. Because of the potential for adverse reactions in nursing infants, women taking LIPITOR should not breast-feed (see CONTRAINDICATIONS). **Pediatric Use** — Safety and effectiveness in patients 10-17 years of age with heterozygous familial hypercholesterolemia have been evaluated in controlled clinical trials of 6 months duration in adolescent boys and postmenarchal girls. Patients treated with LIPITOR had an adverse experience profile generally similar to that of patients treated with placebo, the most common adverse experiences observed in both groups, regardless of causality assessment, were infections. **Doses greater than 20 mg have not been studied in this patient population.** In this limited controlled study, there was no detectable effect on growth or sexual maturation in boys or on menstrual cycle length in girls. See CLINICAL PHARMACOLOGY, *Clinical Studies section* in full prescribing information; ADVERSE REACTIONS, *Pediatric Patients*; and DOSAGE AND ADMINISTRATION, *Pediatric patients (10-17 years of age) with Heterozygous Familial Hypercholesterolemia* in full prescribing information. Adolescent females should be counseled on appropriate contraceptive methods while on LIPITOR therapy (see CONTRAINDICATIONS and PRECAUTIONS, *Pregnancy*). **LIPITOR has not been studied in controlled clinical trials involving pre-pubertal patients or patients younger than 10 years of age.** Clinical efficacy with doses up to 80 mg/day for 1 year have been evaluated in an uncontrolled study of patients with homozygous FH including 8 pediatric patients. See CLINICAL PHARMACOLOGY, *Clinical Studies in Homozygous Familial Hypercholesterolemia* in full prescribing information. **Geriatric Use** — The safety and efficacy of atorvastatin (10-80 mg) in the geriatric population (≥65 years of age) was evaluated in the ACCESS study. In this 54-week open-label trial 1,958 patients initiated therapy with atorvastatin 10 mg. Of these, 835 were elderly (≥65 years) and 1,123 were non-elderly. The mean change in LDL-C from baseline after 6 weeks of treatment with atorvastatin 10 mg was -38.2% in the elderly patients versus -34.6% in the non-elderly group. The rates of discontinuation due to adverse events were similar between the two age groups. There were no differences in clinically relevant laboratory abnormalities between the age groups.

ADVERSE REACTIONS: LIPITOR is generally well-tolerated. Adverse reactions have usually been mild and transient. In controlled clinical studies of 2502 patients, <2% of patients were discontinued due to adverse experiences attributable to atorvastatin. The most frequent adverse events thought to be related to atorvastatin were constipation, flatulence, dyspepsia, and abdominal pain. **Clinical Adverse Experiences** — Adverse experiences reported in ≥2% of patients in placebo-controlled clinical studies of atorvastatin, regardless of causality assessment, are shown in the following table.

Adverse Events in Placebo-Controlled Studies (% of Patients)

BODY SYSTEM Adverse Event	Placebo N = 270	Atorvastatin 10 mg N = 863	Atorvastatin 20 mg N = 36	Atorvastatin 40 mg N = 79	Atorvastatin 80 mg N = 94
BODY AS A WHOLE					
Infection	10.0	10.3	2.8	10.1	7.4
Headache	7.0	5.4	16.7	2.5	6.4
Accidental Injury	3.7	4.2	0.0	1.3	3.2
Flu Syndrome	1.9	2.2	0.0	2.5	3.2
Abdominal Pain	0.7	2.8	0.0	3.8	2.1
Back Pain	3.0	2.8	0.0	3.8	1.1
Allergic Reaction	2.6	0.9	2.8	1.3	0.0
Asthenia	1.9	2.2	0.0	3.8	0.0
DIGESTIVE SYSTEM					
Constipation	1.8	2.1	0.0	2.5	1.1
Diarrhea	1.5	2.7	0.0	3.8	5.3
Dyspepsia	4.1	2.3	2.8	1.3	2.1
Flatulence	3.3	2.1	2.8	1.3	1.1
RESPIRATORY SYSTEM					
Sinusitis	2.6	2.8	0.0	2.5	6.4
Pharyngitis	1.5	2.5	0.0	1.3	2.1
SKIN AND APPENDAGES					
Rash	0.7	3.9	2.8	3.8	1.1
MUSCULOSKELETAL SYSTEM					
Arthralgia	1.5	2.0	0.0	5.1	0.0
Myalgia	1.1	3.2	5.6	1.3	0.0

The following adverse events were reported, regardless of causality assessment in patients treated with atorvastatin in clinical trials. The events in italics occurred in ≥2% of patients and the events in plain type occurred in <2% of patients.

Body as a Whole: *Chest pain*, face edema, fever, neck rigidity, malaise, photosensitivity reaction, generalized edema. ***Digestive System:*** *Nausea*, gastroenteritis, liver function tests abnormal, colitis, vomiting, gastritis, dry mouth, rectal hemorrhage, esophagitis, eructation, glossitis, mouth ulceration, anorexia, increased appetite, stomatitis, biliary pain, cheilitis, duodenal ulcer, dysphagia, enteritis, melena, gum hemorrhage, stomach ulcer, tenesmus, ulcerative stomatitis, hepatitis, pancreatitis, cholestatic jaundice. ***Respiratory System:*** *Bronchitis, rhinitis*, pneumonia, dyspnea, asthma, epistaxis. ***Nervous System:*** *Insomnia, dizziness*, paresthesia, somnolence, amnesia, abnormal dreams, libido decreased, emotional lability, incoordination, peripheral neuropathy, torticollis, facial paralysis, hyperkinesia, depression, hypesthesia, hypertonia. ***Musculoskeletal System:*** *Arthritis*, leg cramps, bursitis, tenosynovitis, myasthenia, tendinous contracture, myositis. ***Skin and Appendages:*** Pruritus, contact dermatitis, alopecia, dry skin, sweating, acne, urticaria, eczema, seborrhea, skin ulcer. ***Urogenital System:*** *Urinary tract infection*, urinary frequency, cystitis, hematuria, impotence, dysuria, kidney calculus, nocturia, epididymitis, fibrocystic breast, vaginal hemorrhage, albuminuria, breast enlargement, metrorrhagia, nephritis, urinary incontinence, urinary retention, urinary urgency, abnormal ejaculation, uterine hemorrhage. ***Special Senses:*** Amblyopia, tinnitus, dry eyes, refraction disorder, eye hemorrhage, deafness, glaucoma, parosmia, taste loss, taste perversion. ***Cardiovascular System:*** Palpitation, vasodilatation, syncope, migraine, postural hypotension, phlebitis, arrhythmia, angina pectoris, hypertension. ***Metabolic and Nutritional Disorders:*** *Peripheral edema*, hyperglycemia, creatine phosphokinase increased, gout, weight gain, hypoglycemia. ***Hemic and Lymphatic System:*** Ecchymosis, anemia, lymphadenopathy, thrombocytopenia, petechia.

Postintroduction Reports — Adverse events associated with LIPITOR therapy reported since market introduction, that are not listed above, regardless of causality assessment, include the following: anaphylaxis, angioneurotic edema, bullous rashes (including erythema multiforme, Stevens-Johnson syndrome, and toxic epidermal necrolysis), and rhabdomyolysis. **Pediatric Patients (ages 10-17 years)** In a 26-week controlled study in boys and postmenarchal girls (n=140), the safety and tolerability profile of LIPITOR 10 to 20 mg daily was generally similar to that of placebo (see CLINICAL PHARMACOLOGY, *Clinical Studies section* in full prescribing information and PRECAUTIONS, *Pediatric Use*).

OVERDOSAGE: There is no specific treatment for atorvastatin overdosage. In the event of an overdose, the patient should be treated symptomatically, and supportive measures instituted as required. Due to extensive drug binding to plasma proteins, hemodialysis is not expected to significantly enhance atorvastatin clearance.

Please see full prescribing information for additional information about LIPITOR.

℞ only

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[*Shoe-fitting fluoroscope* NATIONAL MUSEUM OF AMERICAN HISTORY]

Here's Looking at You, Kids

For three decades, the fluoroscope was a shoe salesman's best friend ~ BY KAREN LARKINS

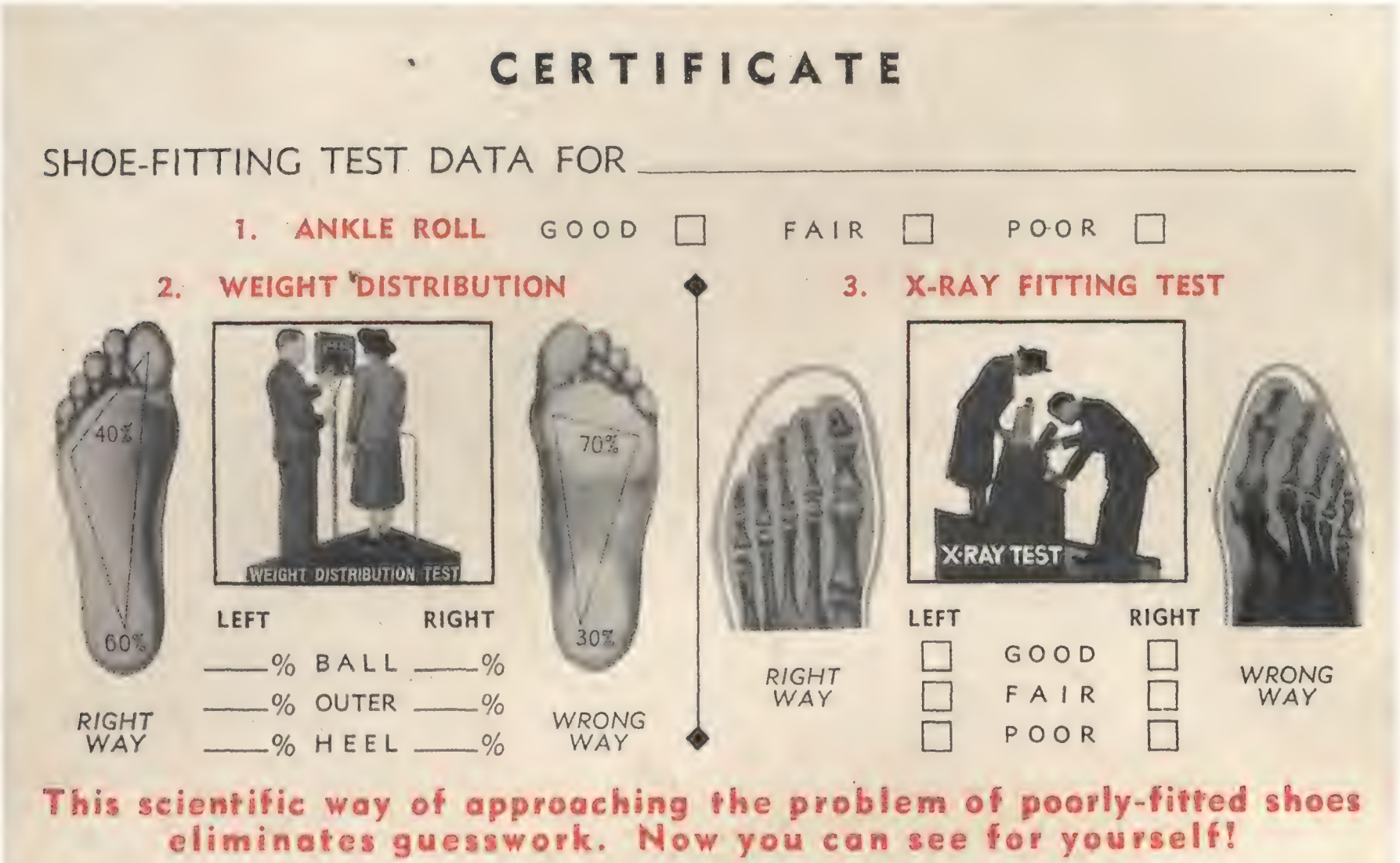
IF YOU WERE BORN anywhere between 1920 and about 1950, you probably recall an odd-looking cabinet that once lured customers into shoe stores across the country.

The shoe-fitting fluoroscope used cutting-edge technology—the x-ray—to reveal the bones and soft tissue of the foot inside the shoe, ostensibly for a better fit. For three decades beginning in the mid-1920s, millions of children and adults in the United States, Europe and other parts of the world peered into the machines for an inside view of their usually wiggling toes.

In 1986, the National Museum of American History acquired a fluoroscope, one of perhaps only a handful extant,

NATIONAL MUSEUM OF AMERICAN HISTORY, S.I

The shoe-fitting fluoroscope would prove "as attractive and exciting to little customers as 'free balloons and all-day suckers.'"



Exercise in pseudoscience: the device, says one historian, ultimately represented the "triumph of salesmanship over common sense."

from a shoe store in northern Ohio. The mid-1930s vintage, walnut-cabinet machine was one of thousands produced by the Adrian X-Ray Company of Milwaukee, Wisconsin, a leading manufacturer of the devices.

From the start, the fluoroscope, invoking the authority of modern science and technology to sell more shoes, functioned more as sales gimmick than fitting aid. O. C. Hartridge, who founded the other major fluoroscope manufacturer, England's Pedoscope Company, understood the power of this marketing ploy. The machines, he wrote in 1937, proved a "valuable ally of the retailer. By enabling him to demonstrate the correctness of his fitting, it permits him to impress customers with the reliability of his service; and in those rare instances where people insist on having shoes that are wrong, it puts the onus on them."

Children, in particular, loved the quirky machines. Fluoroscopes proved "as attractive and exciting to little customers as 'free balloons and all-day suckers,'" wrote Jacalyn Duffin and Charles R. R. Hayter, in their journal article "Baring the Sole: The Rise and Fall of the Shoe-Fitting Fluoroscope." Paul Frame, a health physicist with Oak Ridge Associated Universities, in Oak Ridge, Tennessee, recalls his friends in Toronto, where he grew up, going into shoe stores just to stick their feet in the machines: "Seeing the greenish yellow image of your bones was great fun."

The device reached its peak of popularity in the early 1950s, with some 10,000 in use in shoe stores in the United States. Then, as concerns about the potentially damaging effects of radiation grew, the machines began to disappear. (Researchers have yet to determine whether the machine was responsible for any ill effects.) Smithsonian curator Ramunas Kondratas says the fluoroscope represents "the triumph of salesmanship over common sense and a lack of knowledge about the health consequences of certain technologies." In 1957, Pennsylvania became the first state to ban the machines. By the mid-1960s, they were history.

How do people react today when they encounter a fluoroscope? It's mostly a matter of age. Jim Connor, a curator at the National Museum of Health and Medicine at Walter Reed Army Medical Center in Washington, D.C., where one is on display, says that "visitors over 50 have a flashback experience as they recognize the device. These things are real memory triggers." ○

KAREN LARKINS, SMITHSONIAN'S Copy Chief, is too young to remember fluoroscopes.

OAK RIDGE ASSOCIATED UNIVERSITIES

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Templeton Growth Fund | Morningstar Ratings™ 4/30/03†

OVERALL	THREE YEAR	FIVE YEAR	TEN YEAR
★★★★	★★★★★	★★★★	★★★★

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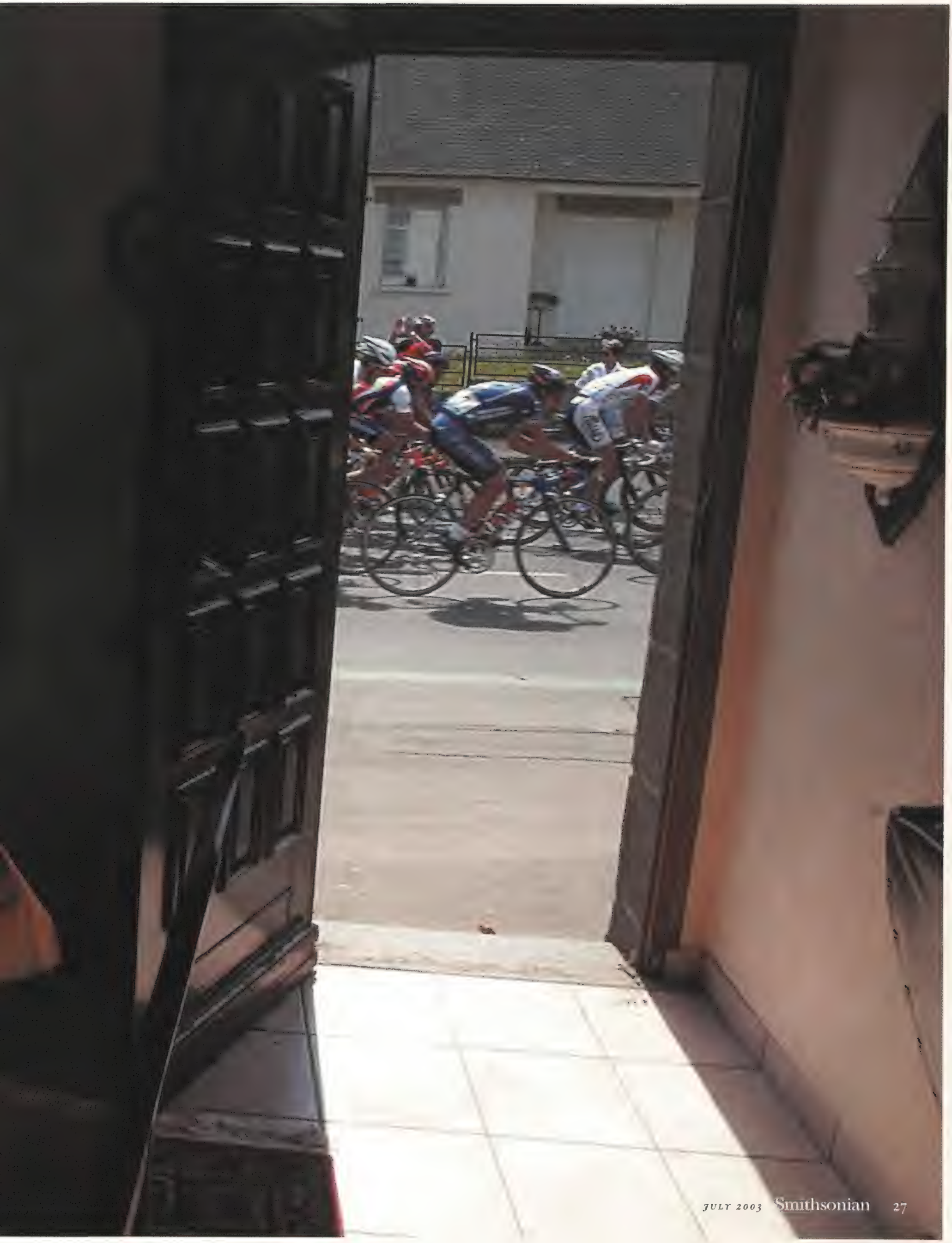
SMI7/03

FRONT ROW SEAT

On July 14, 2002—Bastille Day—cyclists in the 89th Tour de France speed through the village of Landujan in northwestern France on the 135-mile-long eighth leg of the three-week race. The first Tour was held 100 years ago this month. In celebration, this year's 20-leg, 2,077-mile competition will pass through the same cities as the 1903 event, including Lyon, Marseille, Toulouse and Bordeaux, finishing with a 99-mile chase from Ville d'Avray (a town west of Paris and the original race's end point) to the Champs-Elysées. Photographer Eric Gaillard of Reuters has covered 13 Tours de France.



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"Right livelihood," says electric boatbuilder Charles Houghton, is "when everything you have done in your life comes together."

Batteries Included

Let's hear it–shhhh, not so loud–
for electric boats ~ BY LANCE MORROW

SPEEDBOATS HAVE THE KICK of an amusement park—spray in the face, a noisy, bucking rush across the water. I prefer boating at the other extreme, in a kayak or canoe. I like the intimacy with the water—the elegant silence.

I also like the physical work of paddling—a vaguely neurotic Calvinist's itch, perhaps, to earn my pleasures. But if I am feeling lazy, I call up Charles Houghton and see if he is in the mood for a spin on the Hudson in one of his electric boats.

Houghton, 58, runs Elco, the Electric Launch Company. If he has half an afternoon to spare, I meet him at his factory in Athens, New York, on the west bank of the river, 30 miles south of Albany, and we glide noiselessly off in one of his 19-footers, making five or six knots. We watch for the pair of bald eagles that have lately come to nest in a tall dead oak. On the high rise of the east bank to our left lies Olana, artist Frederic Church's Moorish-style manor house, from which he painted the grand view to the southwest, with the Catskills shouldering up in hazy blue-gray profile against the afternoon sun. This is the Hudson River School of boating; we slide back into the 19th century.

Houghton cedes the tiller to me. The throttle is a four-inch lever under my right hand, as simple as a thermostat dial—clockwise forward, counterclockwise back; more turn gives more power. The electric motor, powered by six 160-pound 4D batteries laid along the keel (the weight makes for a very stable ride), emits no more noise than a contented refrigerator. Less. Now and then one of the super tugs out of New York City plows past on its way to Albany; our electric engine muscles through the big wake without a hint of laboring.

The boat is a sleek, neo-Edwardian piece of work, built to the designs that Elco, the first electric boat builder in America, used when it was founded 110 years ago. The company supplied 55 launches for the World's Columbian Exposition of 1893 in Chicago, ferrying thousands of sightseers on the fair's waterways. People such as Thomas Edison, Andrew Carnegie and the grand duke Alexander of Russia bought electric launches. But in time, entrepreneurs of "explosive motors," as internal combustion engines were called, had the wit to change "explosive" to the less alarming word "gasoline," which calmed people who had previously refused to

ALL: GAIL MOONEY

ride in automobiles, and the technology of boats roared off in that direction. Elco itself converted to producing gasoline engines, and eventually, during World War II, built 399 PT boats, including John F. Kennedy's PT-109.

Growing up, Houghton spent his summers on Lake George in upstate New York. There, his great-grandfather, W. K. Bixby of St. Louis, the founder of American Car and Foundry, which once made nearly every railroad car in America, kept a 36-foot Elco boat he bought for $1,736 at the Chicago exposition. "It's still used every day all summer long," says Houghton, who proposed to his wife on it and gave her an electric 24-footer for a wedding present in 1989.

That kind of inspiration led to his interest in the company, which was trying to make a comeback in 1987 after closing in 1949. In 1995, Houghton, who had served as an administrative assistant to Congressman James Symington of Missouri and as executive director of the St. Louis transportation system, and William Forster, a New York banker and a trustee of Mystic Seaport Museum in Connecticut, bought and reorganized Elco. Eventually they set up a factory at the site of an old Dutch boatyard in Athens, started in 1705 to make barges for the river trade. Houghton, by then divorced, moved into the old house of a whaling captain that overlooks the river, just across the road from the factory, where he spends most of his time at a business that is vigorous but still struggling.

For Houghton, a 6-foot-3 genial man with a bardic gift for telling American stories, making electric boats is what the Buddhists call "right livelihood." "It's when everything you have done in your life, every experience and every job comes together and propels you along," he explains. "You are running down the river, not fighting upstream."

The charms of electric boats are environmental as well as aesthetic. They eliminate the noise pollution that conventional powerboats make and the loathsome discharges of oil that foul American rivers and lakes, threatening fish and bird life. Some lakes—notably Lake Tahoe in California—have banned two-stroke engines, the most polluting type. One of the reasons Houghton embarked on his adventure with electric boats was his dismay over the decline of New York's Lake George. "There are just too many boats on the water," he says. "One third of the oil and gas that goes into the front end comes out the back as pure pollution."

No rooster tails. You cannot pull a water-skier or raise hell at 50 mph. I say hurrah for that.

"Electric boats intensify my connection to the water," says Houghton (at tiller).

Even so, Houghton is quick to point out that "people buy them mainly because of the quiet. . . . They have a magic." Not long ago, Houghton sold a boat to Prospect Park Audubon Center in Brooklyn, New York, for use on the park's 60-acre lake. The boat, a 30-footer, often takes schoolchildren around the lake on outings. The kids are boisterous, noisy, keyed up, used to the headlong clatter of subways; when they take their places in the boat and it slides out noiselessly onto the lake, they suddenly fall silent, as if they have just discovered a new dimension of the universe.

"People don't have to yell to be heard," says Pierre Vautravers, the captain of the Brooklyn boat, "and it's wonderful for sneaking up on birds."

The electric boat business is burgeoning now, with more than 60 companies turning out models. The early 21st-century resembles the start-up of the auto industry, with scores of small independents exploring the new market and struggling to get up to cruising speed. Made to order, Elco boats often feature elaborate brass fittings, varnished mahogany decks and oak covering boards. Houghton takes digital photographs of a boat in progress and e-mails them to customers so they can make design changes during the construction. The average boat sells for $40,000 to $60,000 and the most popular extra is a striped picnic canopy, a nice fin de siècle touch that creates the effect of a waterborne surrey with fringe on top.

Houghton predicts that electric boats will become much cheaper with mass production. "It's just what happened to Henry Ford's first cars a hundred years ago," he says.

The boats' batteries hold a charge for eight to ten hours, or about 70 miles. Recharging generally involves simply plugging in a power cord, usually overnight, at a marina.

One of the advantages of electric boats is that they require almost no maintenance—forget the annual winterizing that gas boats in cold climates demand—just a new coat of varnish from time to time on the deck work and some shining of brass.

The limitations are obvious. No bow waves or rooster tails. You cannot pull a water-skier or raise hell at 50 miles per hour. I say hurrah for that.

What I like about them is that, being inaudible, they make you feel invisible on the water. There's a lovely transparency to the day. An afternoon on the Hudson restores my sense of what the Water Rat meant when he told the Mole in *The Wind in the Willows:* "There is nothing—absolutely nothing—half so much worth doing as simply messing about in boats." ○

LANCE MORROW, an essayist for Time *magazine, also teaches at Boston University.*

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(donepezil HCl)

5-MG AND 10-MG TABLETS

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ARICEPT® is well tolerated but may not be for everyone. Some people may experience nausea, diarrhea, not sleeping well, vomiting, muscle cramps, feeling very tired, or not wanting to eat. In studies, these side effects were usually mild and went away over time. Some people taking ARICEPT® may experience fainting. People at risk for ulcers should tell their doctors because their condition may get worse.

Please see additional important product information on accompanying page.

*Individual responses to ARICEPT® can be different – people may get better, stay the same or not get better.

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STRENGTH IN THE FACE OF ALZHEIMER'S™

ARICEPT® (Donepezil Hydrochloride Tablets)

Brief Summary—see package insert for full prescribing information. **INDICATIONS AND USAGE** ARICEPT® is indicated for the treatment of mild to moderate dementia of the Alzheimer's type. **CONTRAINDICATIONS** ARICEPT® is contraindicated in patients with known hypersensitivity to donepezil hydrochloride or to piperidine derivatives. **WARNINGS** ***Anesthesia:*** ARICEPT®, as a cholinesterase inhibitor, is likely to exaggerate succinylcholine-type muscle relaxation during anesthesia. ***Cardiovascular Conditions:*** Because of their pharmacological action, cholinesterase inhibitors may have vagotonic effects on the sinoatrial and atrioventricular nodes. This effect may manifest as bradycardia or heart block in patients both with and without known underlying cardiac conduction abnormalities. Syncopal episodes have been reported in association with the use of ARICEPT®. ***Gastrointestinal Conditions:*** Through their primary action, cholinesterase inhibitors may be expected to increase gastric acid secretion due to increased cholinergic activity. Therefore, patients should be monitored closely for symptoms of active or occult gastrointestinal bleeding, especially those at increased risk for developing ulcers, e.g., those with a history of ulcer disease or those receiving concurrent nonsteroidal anti-inflammatory drugs (NSAIDS). Clinical studies of ARICEPT® have shown no increase, relative to placebo, in the incidence of either peptic ulcer disease or gastrointestinal bleeding. ARICEPT®, as a predictable consequence of its pharmacological properties, has been shown to produce diarrhea, nausea and vomiting. These effects, when they occur, appear more frequently with the 10 mg/day dose than with the 5 mg/day dose. In most cases, these effects have been mild and transient, sometimes lasting one to three weeks, and have resolved during continued use of ARICEPT®. ***Genitourinary:*** Although not observed in clinical trials of ARICEPT®, cholinomimetics may cause bladder outflow obstruction. ***Neurological Conditions:*** Seizures: Cholinomimetics are believed to have some potential to cause generalized convulsions. However, seizure activity also may be a manifestation of Alzheimer's Disease. ***Pulmonary Conditions:*** Because of their cholinomimetic actions, cholinesterase inhibitors should be prescribed with care to patients with a history of asthma or obstructive pulmonary disease. **PRECAUTIONS Drug-Drug Interactions** ***Drugs Highly Bound to Plasma Proteins:*** Drug displacement studies have been performed *in vitro* between this highly bound drug (96%) and other drugs such as furosemide, digoxin, and warfarin. ARICEPT® at concentrations of 0.3-10 µg/mL did not affect the binding of furosemide (5 µg/mL), digoxin (2 ng/mL), and warfarin (3 µg/mL) to human albumin. Similarly, the binding of ARICEPT® to human albumin was not affected by furosemide, digoxin, and warfarin. ***Effect of ARICEPT® on the Metabolism of Other Drugs:*** No *in vivo* clinical trials have investigated the effect of ARICEPT® on the clearance of drugs metabolized by CYP 3A4 (e.g. cisapride, terfenadine) or by CYP 2D6 (e.g. imipramine). However, *in vitro* studies show a low rate of binding to these enzymes (mean K_i about 50-130 µM), that, given the therapeutic plasma concentrations of donepezil (164 nM), indicates little likelihood of interference. Whether ARICEPT® has any potential for enzyme induction is not known. ***Effect of Other Drugs on the Metabolism of ARICEPT®:*** Ketoconazole and quinidine, inhibitors of CYP450, 3A4 and 2D6, respectively, inhibit donepezil metabolism *in vitro*. Whether there is a clinical effect of these inhibitors is not known. Inducers of CYP 2D6 and CYP 3A4 (e.g., phenytoin, carbamazepine, dexamethasone, rifampin, and phenobarbital) could increase the rate of elimination of ARICEPT®. ***Use with Anticholinergics:*** Because of their mechanism of action, cholinesterase inhibitors have the potential to interfere with the activity of anticholinergic medications. ***Use with Cholinomimetics and Other Cholinesterase Inhibitors:*** A synergistic effect may be expected when cholinesterase inhibitors are given concurrently with succinylcholine, similar neuromuscular blocking agents or cholinergic agonists such as bethanechol. **Carcinogenesis, Mutagenesis, Impairment of Fertility** Carcinogenicity studies of donepezil have not been completed. Donepezil was not mutagenic in the Ames reverse mutation assay in bacteria. In the chromosome aberration test in cultures of Chinese hamster lung (CHL) cells, some clastogenic effects were observed. Donepezil was not clastogenic in the *in vivo* mouse micronucleus test. Donepezil had no effect on fertility in rats at doses up to 10 mg/kg/day (approximately 8 times the maximum recommended human dose on a mg/m² basis). **Pregnancy** ***Pregnancy Category C:*** Teratology studies conducted in pregnant rats at doses up to 16 mg/kg/day (approximately 13 times the maximum recommended human dose on a mg/m² basis) and in pregnant rabbits at doses up to 10 mg/kg/day (approximately 16 times the maximum recommended human dose on a mg/m² basis) did not disclose any evidence for a teratogenic potential of donepezil. However, in a study in which pregnant rats were given up to 10 mg/kg/day (approximately 8 times the maximum recommended human dose on a mg/m² basis) from day 17 of gestation through day 20 postpartum, there was a slight increase in still births and a slight decrease in pup survival through day 4 postpartum at this dose; the next lower dose tested was 3 mg/kg/day. There are no adequate or well-controlled studies in pregnant women. ARICEPT® should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. **Nursing Mothers** It is not known whether donepezil is excreted in human breast milk. ARICEPT® has no indication for use in nursing mothers. **Pediatric Use** There are no adequate and well-controlled trials to document the safety and efficacy of ARICEPT® in any illness occurring in children. **ADVERSE REACTIONS Adverse Events Leading to Discontinuation** The rates of discontinuation from controlled clinical trials of ARICEPT® due to adverse events for the ARICEPT® 5 mg/day treatment groups were comparable to those of placebo-treatment groups at approximately 5%. The rate of discontinuation of patients who received 7-day escalations from 5 mg/day to 10 mg/day, was higher at 13%. The most common adverse events leading to discontinuation, defined as those occurring in at least 2% of patients and at twice the incidence seen in placebo patients, are shown in Table 1.

Table 1. Most Frequent Adverse Events Leading to Withdrawal from Controlled Clinical Trials by Dose Group

Dose Group	Placebo	5 mg/day ARICEPT®	10 mg/day ARICEPT®
Patients Randomized	355	350	315
Event/%Discontinuing			
Nausea	1%	1%	3%
Diarrhea	0%	<1%	3%
Vomiting	<1%	<1%	2%

Most Frequent Adverse Clinical Events Seen in Association with the Use of ARICEPT® The most common adverse events, defined as those occurring at a frequency of at least 5% in patients receiving 10 mg/day and twice the placebo rate, are largely predicted by ARICEPT®'s cholinomimetic effects. These include nausea, diarrhea, insomnia, vomiting, muscle cramp, fatigue and anorexia. These adverse events were often of mild intensity and transient, resolving during continued ARICEPT® treatment without the need for dose modification. There is evidence to suggest that the frequency of these common adverse events may be affected by the rate of titration. An open-label study was conducted with 269 patients who received placebo in the 15- and 30-week studies. These patients were titrated to a dose of 10 mg/day over a 6-week period. The rates of common adverse events were lower than those seen in patients titrated to 10 mg/day over one week in the controlled clinical trials and were comparable to those seen in patients on 5 mg/day. See Table 2 for a comparison of the most common adverse events following one and six week titration regimens.

Table 2. Comparison of Rates of Adverse Events in Patients *Titrated to 10 mg/day Over 1 and 6 Weeks*

	No titration		One-week titration	Six-week titration
Adverse Event	**Placebo (n=315)**	**5 mg/day (n=311)**	**10 mg/day (n=315)**	**10 mg/day (n=269)**
Nausea	6%	5%	19%	6%
Diarrhea	5%	8%	15%	9%
Insomnia	6%	6%	14%	6%
Fatigue	3%	4%	8%	3%
Vomiting	3%	3%	8%	5%
Muscle cramps	2%	6%	8%	3%
Anorexia	2%	3%	7%	3%

Adverse Events Reported in Controlled Trials The events cited reflect experience gained under closely monitored conditions of clinical trials in a highly selected patient population. In actual clinical practice or in other clinical trials, these frequency estimates may not apply, as the conditions of use, reporting behavior, and the kinds of patients treated may differ. Table 3 lists treatment emergent signs and symptoms that were reported in at least 2% of patients in placebo-controlled trials who received ARICEPT® and for which the rate of occurrence was greater for ARICEPT® assigned than placebo assigned patients. In general, adverse events occurred more frequently in female patients and with advancing age.

Table 3. Adverse Events Reported in Controlled Clinical Trials in at Least 2% of Patients Receiving ARICEPT® (donepezil HCl) and at a Higher Frequency than Placebo-treated Patients

Body System/Adverse Event	Placebo (n=355)	ARICEPT® (n=747)
Percent of Patients with any Adverse Event	**72**	**74**
Body as a Whole		
Headache	9	10
Pain, various locations	8	9
Accident	6	7
Fatigue	3	5
Cardiovascular System		
Syncope	1	2
Digestive System		
Nausea	6	11
Diarrhea	5	10
Vomiting	3	5
Anorexia	2	4
Hemic and Lymphatic System		
Ecchymosis	3	4
Metabolic and Nutritional Systems		
Weight Decrease	1	3
Musculoskeletal System		
Muscle Cramps	2	6
Arthritis	1	2
Nervous System		
Insomnia	6	9
Dizziness	6	8
Depression	<1	3
Abnormal Dreams	0	3
Somnolence	<1	2
Urogenital System		
Frequent Urination	1	2

Other Adverse Events Observed During Clinical Trials ARICEPT® has been administered to over 1700 individuals during clinical trials worldwide. Approximately 1200 of these patients have been treated for at least 3 months and more than 1000 patients have been treated for at least 6 months. Controlled and uncontrolled trials in the United States included approximately 900 patients. In regards to the highest dose of 10 mg/day, this population includes 650 patients treated for 3 months, 475 patients treated for 6 months and 116 patients treated for over 1 year. The range of patient exposure is from 1 to 1214 days. Treatment emergent signs and symptoms that occurred during 3 controlled clinical trials and two open-label trials in the United States were recorded as adverse events by the clinical investigators using terminology of their own choosing. To provide an overall estimate of the proportion of individuals having similar types of events, the events were grouped into a smaller number of standardized categories using a modified COSTART dictionary and event frequencies were calculated across all studies. These categories are used in the listing below. The frequencies represent the proportion of 900 patients from these trials who experienced that event while receiving ARICEPT®. All adverse events occurring at least twice are included, except for those already listed in Tables 2 or 3; COSTART terms too general to be informative, or events less likely to be drug caused. Events are classified by body system and listed using the following definitions: *frequent adverse events*—those occurring in at least 1/100 patients; *infrequent adverse events*—those occurring in 1/100 to 1/1000 patients. These adverse events are not necessarily related to ARICEPT® treatment and in most cases were observed at a similar frequency in placebo-treated patients in the controlled studies. No important additional adverse events were seen in studies conducted outside the United States. **Body as a Whole:** *Frequent:* influenza, chest pain, toothache; *Infrequent:* fever, edema face, periorbital edema, hernia hiatal, abscess, cellulitis, chills, generalized coldness, head fullness, listlessness. **Cardiovascular System:** *Frequent:* hypertension, vasodilation, atrial fibrillation, hot flashes, hypotension; *Infrequent:* angina pectoris, postural hypotension, myocardial infarction, AV block (first degree), congestive heart failure, arteritis, bradycardia, peripheral vascular disease, supraventricular tachycardia, deep vein thrombosis. **Digestive System:** *Frequent:* fecal incontinence, gastrointestinal bleeding, bloating, epigastric pain; *Infrequent:* eructation, gingivitis, increased appetite, flatulence, periodontal abscess, cholelithiasis, diverticulitis, drooling, dry mouth, fever sore, gastritis, irritable colon, tongue edema, epigastric distress, gastroenteritis, increased transaminases, hemorrhoids, ileus, increased thirst, jaundice, melena, polydipsia, duodenal ulcer, stomach ulcer. **Endocrine System:** *Infrequent:* diabetes mellitus, goiter. **Hemic and Lymphatic System:** *Infrequent:* anemia, thrombocythemia, thrombocytopenia, eosinophilia, erythrocytopenia. **Metabolic and Nutritional Disorders:** *Frequent:* dehydration; *Infrequent:* gout, hypokalemia, increased creatine kinase, hyperglycemia, weight increase, increased lactate dehydrogenase. **Musculoskeletal System:** *Frequent:* bone fracture; *Infrequent:* muscle weakness, muscle fasciculation. **Nervous System:** *Frequent:* delusions, tremor, irritability, paresthesia, aggression, vertigo, ataxia, increased libido, restlessness, abnormal crying, nervousness, aphasia; *Infrequent:* cerebrovascular accident, intracranial hemorrhage, transient ischemic attack, emotional lability, neuralgia, coldness (localized), muscle spasm, dysphoria, gait abnormality, hypertonia, hypokinesia, neurodermatitis, numbness (localized), paranoia, dysarthria, dysphasia, hostility, decreased libido, melancholia, emotional withdrawal, nystagmus, pacing. **Respiratory System:** *Frequent:* dyspnea, sore throat, bronchitis; *Infrequent:* epistaxis, post nasal drip, pneumonia, hyperventilation, pulmonary congestion, wheezing, hypoxia, pharyngitis, pleurisy, pulmonary collapse, sleep apnea, snoring. **Skin and Appendages:** *Frequent:* pruritus, diaphoresis, urticaria; *Infrequent:* dermatitis, erythema, skin discoloration, hyperkeratosis, alopecia, fungal dermatitis, herpes zoster, hirsutism, skin striae, night sweats, skin ulcer. **Special Senses:** *Frequent:* cataract, eye irritation, vision blurred; *Infrequent:* dry eyes, glaucoma, earache, tinnitus, blepharitis, decreased hearing, retinal hemorrhage, otitis externa, otitis media, bad taste, conjunctival hemorrhage, ear buzzing, motion sickness, spots before eyes. **Urogenital System:** *Frequent:* urinary incontinence, nocturia; *Infrequent:* dysuria, hematuria, urinary urgency, metrorrhagia, cystitis, enuresis, prostate hypertrophy, pyelonephritis, inability to empty bladder, breast fibroadenosis, fibrocystic breast, mastitis, pyuria, renal failure, vaginitis. **Postintroduction Reports** Voluntary reports of adverse events temporally associated with ARICEPT® that have been received since market introduction that are not listed above, and that there is inadequate data to determine the causal relationship with the drug include the following: abdominal pain, agitation, cholecystitis, confusion, convulsions, hallucinations, heart block (all types), hemolytic anemia, hepatitis, hyponatremia, neuroleptic malignant syndrome, pancreatitis, and rash. **OVERDOSAGE Because strategies for the management of overdose are continually evolving, it is advisable to contact a Poison Control Center to determine the latest recommendations for the management of an overdose of any drug.** As in any case of overdose, general supportive measures should be utilized. Overdosage with cholinesterase inhibitors can result in cholinergic crisis characterized by severe nausea, vomiting, salivation, sweating, bradycardia, hypotension, respiratory depression, collapse and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved. Tertiary anticholinergics such as atropine may be used as an antidote for ARICEPT® overdosage. Intravenous atropine sulfate titrated to effect is recommended: an initial dose of 1.0 to 2.0 mg IV with subsequent doses based upon clinical response. Atypical responses in blood pressure and heart rate have been reported with other cholinomimetics when co-administered with quaternary anticholinergics such as glycopyrrolate. It is not known whether ARICEPT® and/or its metabolites can be removed by dialysis (hemodialysis, peritoneal dialysis, or hemofiltration). Dose-related signs of toxicity in animals included reduced spontaneous movement, prone position, staggering gait, lacrimation, clonic convulsions, depressed respiration, salivation, miosis, tremors, fasciculation and lower body surface temperature. **DOSAGE AND ADMINISTRATION** The dosages of ARICEPT® shown to be effective in controlled clinical trials are 5 mg and 10 mg administered once per day. The higher dose of 10 mg did not provide a statistically significantly greater clinical benefit than 5 mg. There is a suggestion, however, based upon order of group mean scores and dose trend analyses of data from these clinical trials, that a daily dose of 10 mg of ARICEPT® might provide additional benefit for some patients. Accordingly, whether or not to employ a dose of 10 mg is a matter of prescriber and patient preference. Evidence from the controlled trials indicates that the 10 mg dose, with a one week titration, is likely to be associated with a higher incidence of cholinergic adverse events than the 5 mg dose. In open label trials using a 6 week titration, the frequency of these same adverse events was similar between the 5 mg and 10 mg dose groups. Therefore, because steady state is not achieved for 15 days and because the incidence of untoward effects may be influenced by the rate of dose escalation, treatment with a dose of 10 mg should not be contemplated until patients have been on a daily dose of 5 mg for 4 to 6 weeks. ARICEPT® should be taken in the evening, just prior to retiring, and may be taken with or without food.

Eisai Inc. Teaneck, NJ 07666 · Pfizer U.S. Pharmaceuticals New York, NY 10017

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Portrait of the Artist as a Plucky Duck

Wildlife painter Ron Louque, winner of the 2003 Duck Stamp Contest, proves that persistence pays off

RON LOUQUE likes ducks. He paints them, photographs them and even stuffs them. But what the 51-year-old artist has wanted most of all is to win the highly competitive, and lucrative, annual Federal Duck Stamp Contest. So every year for the past 30 years, he has entered a painting: blue-wing teals in a marsh; black scoters in moonlit flight; a pintail on a misty shoreline. Last fall, with a painting of snow geese flying past Virginia's Assateague Island Lighthouse, Louque finally won.

"His painting is a very effective use of light," says contest judge Tom Fulgham, editor of *Ducks Unlimited* magazine. "The sky is dark and stormy, kind of moody. The white snow geese just pop dramatically."

Louque (pronounced Luke) will be at the Smithsonian on July 1 when this year's Federal Duck Stamp bearing his painting goes on sale at the National Postal Museum's first-day-of-issue ceremony. The 1.8-by-1.2-inch stamp, officially known as the Migratory Bird

Ron Louque's winning entry (above) "just came alive," says Duck Stamp judge Peter Schreyer, who heads Florida's Crealde School of Art. That Louque (top, in Virginia's Moormans River) entered the contest every year for three decades, Schreyer adds, exemplifies the artist's "love and dedication."

MOLLY ROBERTS; U.S. FISH AND WILDLIFE SERVICE

Hunting and Conservation Stamp, won't be used as postage. Instead, waterfowl hunters must affix one (cost: $15) to their state game licenses. Since 1934, when the Duck Stamp program began, $600 million from stamp sales has saved some five million acres of wetland and river habitat.

Louque thrives in such places. On a bright spring afternoon, while walking along the Moormans River near his home in Charlottesville, Virginia, he explained his quest to win the contest. "Ducks are my life," Louque said. "Maybe you could call it an obsession." As a boy, that preoccupation took the form of hunting and taxidermy, a skill he taught himself at age 9 through a correspondence course. "Where I grew up, hunting was a way of life."

Born one of seven in a Louisiana Cajun family, 6-year-old Louque rambled through the bayous along the Mississippi River near his home in Donaldsonville, sporting a Daisy Red Ryder air rifle. He took potshots at trees, and occasionally, he would bag a starling or a house sparrow. After learning taxidermy, he delighted in preserving the birds' postures, as well as the subtle patterns on their backs and the hidden iridescent colors in their feathers. Hunting became a search for specimens. "I'll never forget the time," he said, "that I got my first duck."

On a cold, dark November morning, 11-year-old Louque and a friend set out decoys and hid with their shotguns behind thick hanging roots along a bank of the Mississippi. When a line of wood ducks flew his way, he got one. "But it fell 30 feet into the current," Louque recalled. Desperate to retrieve the bird, he stripped to his underwear and jumped in. "I was all the way up to my neck in the freezing water. But I got the duck."

He preserved the trophy, posing it standing on a log, and before long, his parents' home was filled with stuffed ducks: mallards and widgeons, woodcocks and ruddies. "You couldn't walk in our house without stepping on them," he said, laughing.

At Louisiana State University, where Louque went to study zoology, the allure of hunting and taxidermy waned as he discovered another passion—art. He became a skilled scientific illustrator after hanging around ornithologists at LSU. He taught himself composition and design after meeting a German landscape artist. He mastered lighting and atmospheric effects when he took up photography. And in 1973, he entered his first duck stamp contest. Over the years, he won 27 state duck stamp contests, and in 1986 he placed third in the federal contest.

Ron Louque stands to make a lot of money this year—an estimated $350,000—from the sales of prints of his winning painting. But Louque, who calculates he's spent five unpaid years creating his entries, said he isn't motivated by the money. In earnest he said: "I felt like this was my destiny."

Last fall, when the judges decided his was the best of 249 entries, Ron Louque shed tears of joy.

—*BETH PY-LIEBERMAN*

Winning entries from the 2003 Junior Duck Stamp Contest, open to kindergarten through grade 12 students, are on view through July 31 at the National Postal Museum, where visitors can also find the permanent exhibition "Artistic License—The Duck Stamp Story."

FROM THE ATTIC

NATIONAL MUSEUM OF AMERICAN HISTORY, SMITHSONIAN INSTITUTION

THE FLAG WAS STILL THERE By 1914, the century-old Star-Spangled Banner that had inspired Francis Scott Key's poem was "a frail piece of bunting," said a curator at the time. On May 1 of that year, Smithsonian secretary Charles Walcott called upon expert needlewoman Amelia Fowler (above, standing) and her patented preservation technique, which had saved 175 flags. Using dyed-to-match silk thread, Fowler and ten assistants reinforced the 1,020-square-foot relic by anchoring it onto Irish linen with 1.7 million of Fowler's special six-sided stitches. "We do not 'restore' the war banners," she told the *Washington Post*, "but put them in shape to defy the test of time." To find the proper backing, she had examined France's medieval Bayeaux Tapestry, as well as the wrappings of Egyptian mummies in the British Museum. By July 22, her work was done. Fowler's fee: $1,243. Her efforts preserved the flag until a modern, and ongoing, conservation program—budgeted at $18.2 million—got under way in 1998. —*BETH PY-LIEBERMAN*

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Tom Feelings' 1965 *White Ships/Black Cargo* (left), and a drawing of slaves spooned tightly together, depict the slavers' brutality.

Voices from the Middle Passage

An exhibition recounts the "triangle trade" that exchanged African lives for goods

THE SMITHSONIAN'S Anacostia Museum and Center for African American History and Culture hosts "Captive Passage: The Transatlantic Slave Trade and the Making of the Americas" through August 31. The Mariners' Museum of Newport News, Virginia, organized the show, which will travel to U.S. museums through 2007. The excerpts at right, from 19th-century books, are among nine recorded narrations that can be heard in the exhibition. They recount details of the Middle Passage—the journey from Africa to the Americas. Slavers traded their human cargo for sugar and tobacco for the return voyage to Europe.

"The schooners were fitted with bulkheads, in the fashion of regular slavers. . . . The largest males were packed first in the hold, sitting cross-legged in rows, back to back. They faced each other closely, and a hundred were thus crammed into each schooner under decks. The women and girls were all stowed in one hold. After securing these below, about fifty were tied around the masts and rails of both vessels; and by this time every available foot of space had been covered with black flesh. The slaves are to get two meals a day, of boiled beans or rice; each has a light wooden dish and spoon tied about the neck. The gangs are to come on deck, in fine weather, to dance and enjoy themselves."

—RICHARD DRAKE, *an Englishman who immigrated to the United States and worked on slave ships from 1807 to 1857. The incidents above took place in May 1808 aboard the* Coralline.

"After being about 15 days out to sea a heavy squall struck the ship. The poor slaves below, altogether unprepared for such an occurrence, were mostly thrown to the side, where they lay heaped on the top of each other; their fetters rendered many of them helpless, and before they could be arranged in the proper places, and relieved from their pressure on each other, it was found that 15 of them were smothered or crushed to death. The captain seemed considerably vexed; but the only grievance to him was the sudden loss of some five or six thousand dollars."

—ZAMBA ZEMOLA *told his story in* The Life and Adventures of Zamba, an African Negro King; and his Experience of Slavery in South Carolina, *published in 1847.*

HURRY IN

"Arctic National Wildlife Refuge: Seasons of Life and Land," featuring photographs by Subhankar Banerjee, is at the Natural History Museum through September 2. In March, Senator Barbara Boxer, Democrat of California, cited the pictures to argue against oil drilling in the refuge.

Aurora borealis, November 5, 2001.

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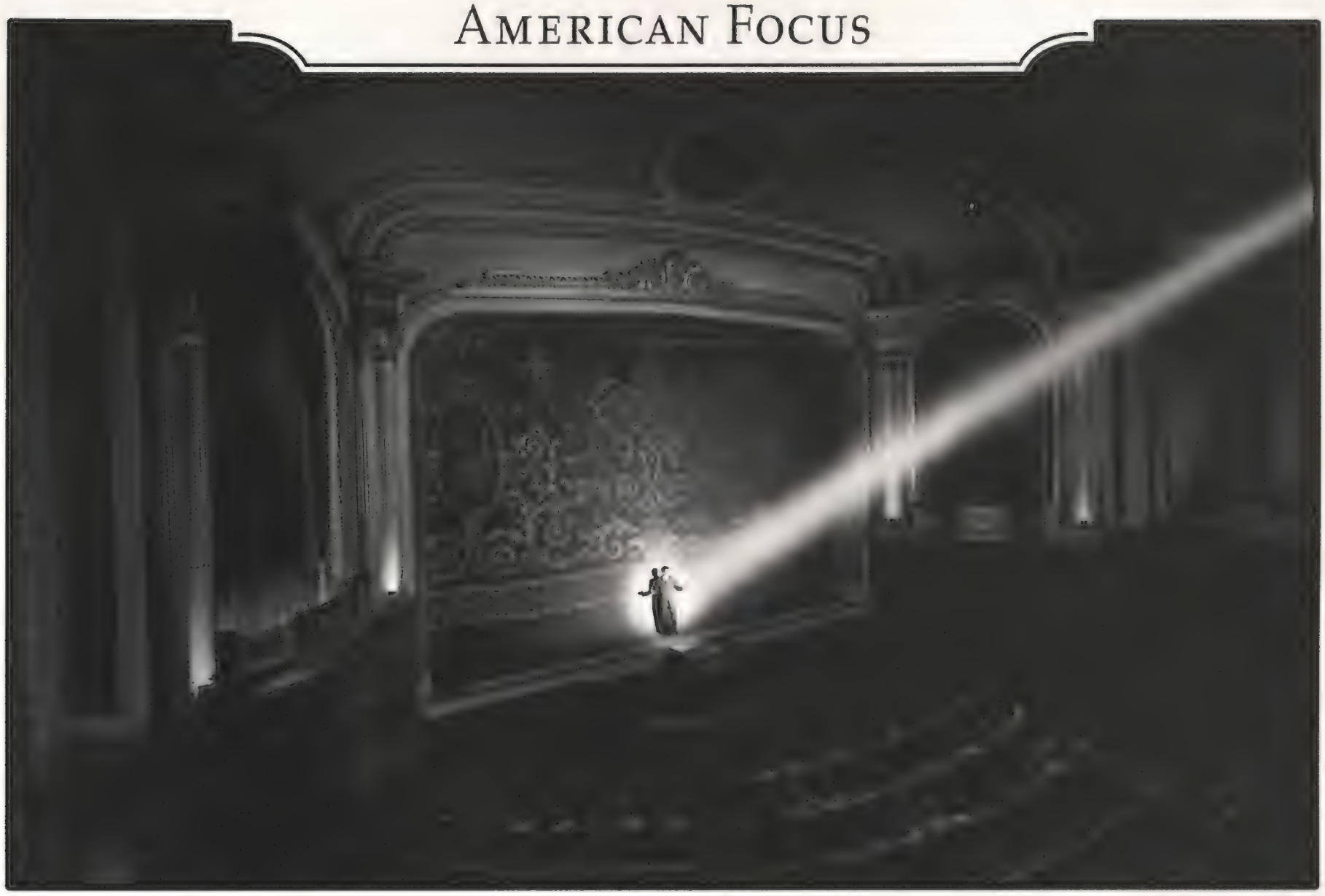
TOM FEELINGS; JEAN BOUDRIOT; SUBHANKAR BANERJEE

American Focus



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KOREA
A HOUSE DIVIDED

Fifty years after the armistice, the two Koreas' legacy of conflict underlies a deepening crisis

BY JONATHAN KANDELL

REUTERS NEWMEDIA / CORBIS

While a Stalinist regime (its slogans emblazoned on banners in Pyongyang, opposite) has mired the North in poverty, the South is awash in affluence (teenagers throng Seoul's computer-game salons, above). On both sides, Koreans long for reunification.

JEROME MING / CORBIS SABA

DRIVING NORTHEAST FROM SEOUL, I follow the course of the sinuous Han River, past harvested rice fields, up into steep, forested hills. Forty minutes outside the thriving South Korean capital, the Seoul Studio Complex looms like a fortress. Its vast screening and postproduction facilities are burrowed into a mountainside, seemingly impregnable to any bombardment from North Korean positions not far away. A tourist mecca, the complex advertises itself as the largest film-studio center in Asia, with sets familiar to South Korean movie audiences.

First stop for the busloads of visitors is usually the Panmunjom set, a near-perfect replica of the real Panmunjom, the village on the border of North and South Korea where officials of the two nations have met periodically for largely sterile discussions ever since the armistice ending the Korean War was signed there on

July 27, 1953. Tourists, crowding into a barracks-like structure, press their faces against the windows of a mock conference room, staring at the dark line that bisects the replica negotiating table. The line, if extended, would run the full 151-mile length of the Demilitarized Zone (DMZ) that divides the Korean peninsula. "As kids, we were taught that each side would push its little flag an inch or two over the line that divides the real conference table and the country," says Jean Noh, 27, the government film commission executive who is guiding me around the Panmunjom set. "Here, people can cross back and forth over the line." As if on cue, a middle-aged couple request that Noh photograph them standing in "North Korea." Then they ask her to aim the camera at them in front of the pagoda-shaped gateway to "South Korea," a portal festooned with a sign reading "House of Freedom."

It's not surprising that many South Koreans prefer to contemplate their relationship with the North through the virtual reality of a movie set. The actuality is too complex and terrifying. Fifty years after the war, some 700,000 North Korean soldiers with thousands of artillery pieces are arrayed along the DMZ, capable of devastating Seoul, only 25 miles away.

"The scariest place on earth," President Bill Clinton called the fenced and heavily guarded DMZ even before he toured it in 1993. Standing at this same border in February 2002, President George Bush called for a Korea "one day united in commerce and cooperation, instead of divided by barbed wire and fear." Today, tensions have escalated ominously as North Korea asserts it has already processed 8,000 spent nuclear rods from a power plant into material that could be used in a nuclear bomb.

Even a scenario some South Koreans and Westerners would welcome—the political and economic collapse of the North (already suffering from severe food and fuel shortages) followed by a reuniting of the two Koreas—presents a sobering prospect. One global investment bank recently estimated that a sudden reunification would cost the South up to three trillion dollars over the first decade. "This would be far more expensive than the reunification of Germany," says Sunghyun Henry Kim, a South Korean economist at Tufts University. "Our economy could not possibly afford it."

Nonetheless, the urge to unite with their northern brethren—to step across the real DMZ—is deeply rooted in the South. "This country was unified for 13 centuries before 1945, when it was divided as an

With China and Russia to the north and Japan offshore to the southeast, Korea has for centuries been contested territory. The peninsula's "strategic location" and "enduring tension," in author Don Oberdorfer's words, have long commanded world attention.

MAP: MIKE REAGAN; CORBIS; HULTON ARCHIVE / GETTY IMAGES; CORBIS (2)

A Century of Strife

1900
Emperor Kojong rules Korea under Japanese authority.

1910
Japan annexes Korea.

1945
World War II ends. Japan surrenders Korea: south of the 38th parallel, to the U.S.; north, to the Soviet Union.

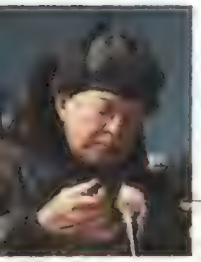
1950
North Korean troops cross 38th parallel; Korean War begins. China sides with the North.

1948
North Korea and South Korea become independent countries.

1951
President Truman fires Gen. Douglas MacArthur (left); replaces him with Lt. Gen. Matthew Ridgway.

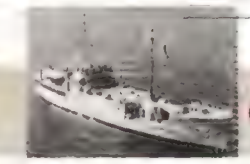
JEROME MING / CORBIS SABA; BETTMANN / CORBIS (2); AVIATION SAFETY NETWORK; AFP / CORBIS (2); JANET WISHNETSKY / CORBIS; JOHN LEICESTER / AP PHOTO

Virtual reality: at a film-studio complex outside Seoul (where tourists flock to a set re-creating Panmunjom, the location where the 1953 armistice was signed and fruitless talks continue), South Koreans contemplate tensions with the North—from a safe distance.



1952
Gen. Dwight D. Eisenhower goes to Korea.

1953
War ends; DMZ established.

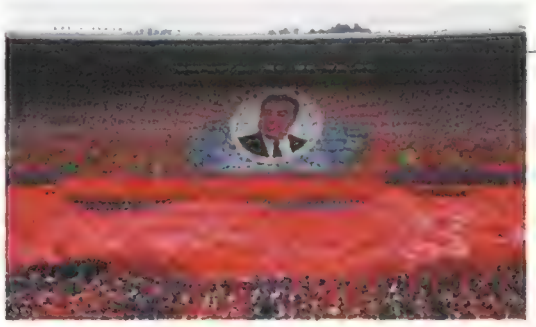


1968
North Korea seizes USS Pueblo, holds 82 crewmen hostage for 334 days.

1987
Explosion of Korean Airlines jet kills 115. North Korea implicated.

1988
Trade begins between North and South Korea.
Summer Olympics held in Seoul.

SEOUL 1988



1994
Kim Il Sung, leader of North Korea, dies. His son, Kim Jong Il, succeeds.
"Agreed Framework" between U.S. and North Korea. North Korea will dismantle nuclear weapons program.

1998
Kim Dae Jung becomes president of South Korea.

2000
Pyongyang summit between Kim Jong Il and Kim Dae Jung.
North Korea threatens to restart nuclear program.

2002
President George W. Bush includes North Korea in "axis of evil"; visits South Korea.
Hundreds of separated North and South Korean families reunite.
North Korea admits it has nuclear weapons.

2003
North Korea withdraws from the Nuclear Non-Proliferation Treaty.

expedient by the United States to prevent it from being entirely taken over by the Soviet Union," says Don Oberdorfer, author of *The Two Koreas*. In the waning days of World War II, the Soviet Union declared war on Japan and occupied Korea, annexed by Japan in 1910. Under a hasty agreement, Korea was partitioned at the 38th parallel: the northern part of the peninsula came under Soviet control; the southern region, including Seoul, came under the aegis of the United States.

The Soviets and Americans withdrew by 1950, leaving behind two bitterly opposed regimes: the Communist North led by Kim Il Sung, a young guerrilla leader who had fought the Japanese, and the southern peninsula, under an aging, U.S.-backed patrician, Syngman Rhee, who had been elected president by an assembly.

Then, on June 25, 1950, North Korean tanks and troops poured across the 38th parallel, capturing Seoul within three days. President Harry Truman appointed Gen. Douglas MacArthur, hero of the war against Japan (and Allied commander of the seven-year occupation of Japan that followed its defeat), as commander of a U.S.-led force of United Nations troops, to roll back the North Korean invasion. In a spectacular counterattack in September, MacArthur's forces staged an amphibious landing at Inchon, on the western coast not far from Seoul. By October, the North Korean Army was routed and Pyongyang taken. But when U.N. forces neared the Yalu River, marking the Korea-China border, Chinese troops unleashed a massive offensive, conquering northern Korea and, by January 1951, Seoul. In April, after acrimonious disputes over military strategy, Truman fired MacArthur, who wanted the option of using nuclear bombs against China, and replaced him with Lt. Gen. Matthew Ridgway. The war continued without either side gaining decisive advantage.

Dwight Eisenhower broke the bloody stalemate. Elected president in November 1952 after making a campaign pledge to "go to Korea," Ike indeed went there, before his inauguration. Bundled up in a heavy jacket, fur-lined hat and thermal boots, "Eisenhower did what he had done so often during World War II," wrote biographer Stephen Ambrose. "He studied an artillery duel with his binoculars, chatted with the troops, ate outdoor meals from a mess kit. . . . " Eisenhower decided the war was unwinnable and should be quickly ended on honorable terms. He recognized that North Korea would exist as a separate nation and called for an armistice.

Losses on either side of the newly drawn DMZ were appalling. An estimated 1,000,000 Chinese and 600,000 North Korean soldiers had been killed or wounded. The figure for U.N. troops was about 300,000, more than two-thirds of them South Koreans. Some 37,000 Americans were killed or missing, and another 103,000 wounded. Civilian casualties were even higher. About four million Koreans, nearly one-tenth of the whole peninsula's population, were killed or wounded, and another five million turned into refugees.

IN THE HALF-CENTURY since the end of the war that left Seoul in ruins, that city's population has multiplied ten-fold, to 9.6 million inhabitants, or one-fifth of the nation's population. In South Korea, per capita annual income has mushroomed 100-fold to $10,000. Other cities in the world have grown as fast, but none has done so while simultaneously shedding poverty for middle-class affluence. I try to imagine how visitors and North Korean defectors and refugees react upon first arriving in Seoul. Are they awed by the phalanxes of skyscrapers sheathed in flashing video advertisements? Do they stand paralyzed at street corners witnessing the endless traffic jams of new automobiles?

Most likely, they share my own culture shock upon encountering Seoul's marketplaces. Some are bazaars that stretch over a hundred square blocks, their street stalls fusing into shops and multistoried arcades. The shopping frenzy continues even below street level. It's possible to walk an hour through underground malls without retracing one's steps.

My own exploration of the city's commercial center begins at Dongdaemun, or Great East Gate Market, named for an immense stone archway with curving tiled eaves, a monument erected in 1869. (There has been a city gate on this site for six centuries.) Open round the clock, Dongdaemun consists of

From 1950 to 1953, intense fighting (in 1951, U.S. troops advance in the South) cost millions of lives and reduced Korea to rubble. American general Eugene O'Donnell reported to Congress in 1951 that "almost the entire Korean peninsula . . . is destroyed."

U.S. ARMY / AP PHOTO

JONATHAN KANDELL is a New York-based freelance writer who travels often to Asia. He last wrote for SMITHSONIAN *on Iraq.*

29 shopping malls and 30,000 retailers—a vast, crowded maze of shops offering items from shoes to electronic goods (lipstick-size MP3 players, calculators that flash psychedelically, cell phones so tiny they hang from necklaces), from army surplus and camping equipment to chandeliers, from neon lighting fixtures to restaurant refrigerators.

I arrive at Dongdaemun shortly after midnight, when the wholesale clothing market is in full swing. Bus caravans disgorge shoppers and shop owners from around the country and abroad who are here to purchase knockoff Armani suits and the billowing traditional Korean dresses called *hanbok*, cashmere sweaters and rough-cotton NFL jerseys, satin slacks and faded blue jeans. I'm on constant guard against overloaded scooters and pushcarts. Most dangerous of all are the squads of *ajumma*—"aunties"—wielding sharp elbows as they hustle their booty back to waiting vans.

South Korea's young (whose idols are computer-game stars, including Kang Do-kyung, 20, above) regard the war as ancient history. Says Seoul academic Yoon Tae-hee: "Many kids don't feel any gratitude to the U.S. and don't view American troops as protectors."

Even in this crush, Katya Morozova and Olga Lavrentieva stand out. Tall, blonde Russians in their 20s, they travel to Seoul several times a year to buy coats, jackets and dresses for resale at street fairs in Moscow. In broken Korean and improvised sign language, they bargain with a middle-aged male vendor at the Pyeonghwa Fashion Plaza, a five-story clothing emporium. "*Olma imnikka?*"—"How much?" asks Morozova, pointing to a knee-length leather overcoat. She gets a steep discount after agreeing to double her order to 20 coats and pay in cash.

A porter hoists their purchases onto a wooden A-frame, which he straps to his back. With a cane to keep his balance and a shrill voice to warn shoppers out of the way, he leads us back to the Russians' hotel. I follow Morozova and Lavrentieva on several more buying forays, until dawn reddens the craggy mountain peaks on Seoul's outskirts. As plaintive Korean ballads blare from unseen disc players, we hover around street food stands for a breakfast of skewered meats, fried minnows, vegetable omelettes, kimchi (garlicky, scorchingly spicy pickled cabbage) and pungent, chewy *bundegi*, or silkworm larvae, which are definitely an acquired taste.

SIRENS BEGIN TO WAIL throughout the city, signaling the monthly civil defense drill against a possible North Korean surprise attack. Residents are supposed to head to the nearest shelter and await the all-clear signal 20 minutes later. I happen to be underground in COEX, one of the largest subterranean malls. I'm exploring the world of PC bangs—computer-game rooms. There are more than 25,000 PC bangs in the city, some with hundreds of candy-colored computer terminals, at which youths spend hours besieging fortresses, playing virtual basketball against anonymous opponents, and flirting on-line with strangers.

According to Oh Yong Tae, a producer for a television network that specializes in on-line games, PC bangs (*bang* means "room") have flourished because open space is so hard to find. "There's not enough space for everybody to play soccer or basketball or just hang out," says Oh. "So we developed a 'bang culture'—karaoke bangs to get together and sing, DVD bangs to watch videos with friends, and PC bangs to play games." To accommodate demand, South Korea has built a high-speed, broadband Internet system that is unparalleled in the world. More than half of the country's households have broadband connections, compared with 16 percent in the United States.

With 400 computer terminals, Megawebstation, located deep in the COEX mall, is one of the largest PC bangs. It is also the site of tournament matches for Starcraft, an on-line game. Oh's cable station broadcasts the matches to a nationwide audience of millions. Why in the world, I wonder, would so many people watch televised games they could play themselves? "For the same reason people watch championship golf," says Oh. "They want to see the best athletes and maybe pick up techniques to improve their own game."

The premier players are objects of adulation (and endorsement contracts). Kang Do-kyung, a top-ranked Starcraft player, is surrounded by teenage fans pleading for an autograph shortly before a televised match at Megawebstation. "When I was young, I played video games at the arcades five or six hours a day," says Kang, 20. "I could see I was blessed with a special talent." His parents didn't think so. But by 17, Kang was accomplished enough at Starcraft to play in lucrative (prize money can amount to $100,000 annually) national tournaments. His parents stopped objecting.

Today, dressed in white-and-gold gladiator tunics, Kang and

JEROME MING / CORBIS SABA

his challenger emerge through a dry-ice fog to wild cheers from several hundred spectators crammed into a crescent-shaped arena. The contestants sit at facing computers. An oversize screen displays the progress of the game, which is a variation on cyberwarfare. Two analysts on TV explain the players' strategies and highlight spectacular moves. In less than 30 minutes, Kang routs his opponent, who surrenders by flashing "GG"—for "Good Game"—on his computer screen.

At PC bangs, men outnumber women by at least four to one. Oh suggests that the medieval warrior themes are less appealing to women than to men. "Or maybe women are too smart to spend all that time in front of a computer playing a game," he says.

But many young women inhabit their own cyber fantasy world. In a computer room at Kyungwon University, on a break from her interior design class, Lee Sun-young goes on-line to show me her personal "avatar," a cartoon character that serves as her on-line alter ego. Hers is a skateboarder named Sonya, with long dark hair and flamboyant sunglasses. "She's the type of person I'd like to be—very extravagant and wild," says Lee, who seems reserved herself, with short hair and wire-rimmed glasses. Lee uses her avatar when communicating on-line with friends, each of whom has her own avatar.

In South Korea, a traditional reliance on matchmakers to arrange marriages is giving way, in part, to "booking clubs," bars where the affluent young can meet on their own. A recent phenomenon, the nightspots began appearing about eight years ago.

Although men and women often meet in on-line chat rooms, South Korea remains a deeply conservative society in which about half of all marriages are arranged with the help of professional matchmakers.

Through friends, I am introduced to Mrs. Yang, a matchmaker, and one of her current clients, Ms. Kim, a 30-year-old sculptor. (Citing the need for discretion, both women insist they be identified only by their family names.) We meet in the coffee shop of a luxury hotel. Yang, who appears to be about 80, wears a sensible blue wool suit and turquoise silk scarf, and carries a large, leather 1950s-style handbag. Many years ago, she was a kindergarten teacher and sang in a church choir. "I met lots of young people in the choir who were looking for marriage partners, and for ten years, I helped such people out for free," she says. What makes for a good matchmaker? "Taking notes," she says. "Whenever I hear about somebody eligible, I begin keeping a record on the person and add to it constantly." When I ask Kim about her experiences with the matchmaker, she says Yang has introduced her to an engineer, an accountant and a lawyer. The first two candidates didn't last beyond the arranged coffee shop rendezvous. The lawyer became Kim's boyfriend for several months and wanted to marry her. "But I decided he wasn't for me," she says. Yang is sure that in time she will come up with a bridegroom for Kim. "It's just a matter of destiny," says the matchmaker. "I have somebody in mind for her at this very moment—a dentist, 34 years old." Kim winces, evidently thinking her destiny lies elsewhere.

When I meet with Kim for dinner the following evening, she tells me that she is secretly involved with a professor of economics and wants to give the relationship time to grow. She has agreed to the matchmaking charade only to appease her parents.

MAKE WHAT you will of young South Koreans' obsession with cyberwarfare and the search for the perfect partner, but these pursuits occur against a backdrop of unrelenting crisis. Tensions with North Korea escalated in 1993, not long after President Clinton's visit to the DMZ.

Through aerial and satellite photography, the United States discovered in 1989 that North Korea had built a secret reprocessing facility that could turn spent fuel from a nuclear power station into weapons-grade plutonium. The North Koreans turned away international inspection teams from suspected nuclear waste sites at Yongbyon, and then, in 1993, threatened to withdraw from the Nuclear Non-Proliferation Treaty. In 1994, Clinton ordered the Pentagon to explore a military option against the North Korean nuclear program. "We were dead earnest in the Defense Department both about a strike on Yongbyon and a wider war plan," recalls Ashton Carter, former assistant secretary of defense. Then, in July 1994, North Korea's "Great Leader," Kim Il Sung, died of a heart attack at age 82. He was succeeded by his son, Kim Jong Il, then 53, a movie-loving playboy turned despot who is thought to have played a leading role in the secret Yongbyon nuclear program. By October of that year, the United States and North Korea, concluding a series of tortuous negotiations, reached a settlement. Under this so-called Agreed Framework, North

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Korea would shut down the Yongbyon facilities and stop construction of a nuclear plant at another location. In return, the United States would help the Pyongyang regime build two nuclear power stations for domestic energy production with light-water reactors (whose fuel cannot easily be converted to weapons production). Moreover, Washington also agreed to donate 500,000 tons of fuel oil annually to North Korea until the first light-water reactor became operational.

Behind North Korea's nuclear brinkmanship was a growing economic despair. Despite an ideology of self-reliance, or *juche*, as Kim Il Sung called it, North Korea had remained heavily dependent on outside aid, principally from the Soviet Union and, to a lesser extent, from China. As part of juche, the Pyongyang regime aimed for food self-sufficiency. To compensate for a lack of fertile land, the North Koreans spent heavily on pesticides, fertilizers and electrified irrigation. "They were pursuing an irrational, extremely input-intensive form of agriculture," says Marcus Noland, an economist and author of *Avoiding the Apocalypse: The Future of the Two Koreas*.

By the early 1990s, North Korea was in dire economic straits. With the collapse of Communism in the Soviet Union and Eastern Europe, aid and exports to North Korea shriveled. The country could no longer finance its agricultural practices. Severe floods in 1995 devastated crops, deepening a famine. Estimates of North Koreans who died of starvation in the last years of the 20th century range as high as two million, more than were killed in the Korean War.

When he took office last December, South Korean president Roh Moo Hyun, an advocate of rapprochement with the North, declared "we are at a historical . . . crossroad of having to decide whether . . . to move toward peace or to move toward tension."

So, Pyongyang used its nuclear facilities as a bargaining chip. "Basically, we had to bribe them with food and oil in order to get them to negotiate over their nuclear weapons program," says Noland. Under the Agreed Framework, the United States, Japan and South Korea funneled rice and other foodstuffs to North Korea, which relies on outside humanitarian aid to provide as much as one-quarter of the food it consumes.

As it happened, the near outbreak of hostilities between the United States and North Korea in 1994 coincided with a movement in South Korea to promote a more conciliatory relationship between the two Koreas. "For the young, the war and poverty of their parents' generation are very abstract concepts," says Yoon Tae-hee, president of Seoul University of Foreign Studies. "Many kids don't feel any gratitude to the United States and don't view the American troops here as protectors." They rallied behind a new president, Kim Dae Jung, who after winning election in December 1997, launched a "Sunshine Policy" to engage the North peacefully. In 2000, President Kim traveled to Pyongyang and met with Kim Jong Il. Agreements followed, with the South pledging economic assistance and the North permitting some citizens to meet with relatives in South Korea for the first time since the Korean War. The unstated hope in the South was that peaceful coexistence and renewed economic growth in the North would eventually lead to unification. In the meantime, "the great majority of South Koreans would prefer to have the North stagger along, allowing more family visits, maybe improvements in human rights," says Stephen Bosworth, who was U.S. ambassador in Seoul during the early stages of the Sunshine Policy.

A sign of the relaxing of the South's wariness of the North was the 1999 movie *Shiri*, which chronicles the experiences of an elite team of North Korean commandos who infiltrate Seoul, trying to provoke another war in the misguided hope that it will precipitate unification and end famine in the North. The film broke all box-office records. "I wrote the script trying to imagine myself living in a neutral country, not emotionally involved with either side," the film's director, Kang Je-gyu, had told me in an interview a few days before.

But the new policy hasn't made the Pyongyang regime any less erratic. It suspended, then reinstated, then suspended again such symbolic gestures as family reunions, and connected North-South rail systems. Far more frightening, the North has precipitated a full-blown security crisis, again involving a nuclear threat.

IN JANUARY 2002, President Bush, in a speech to Congress, categorized North Korea, along with Iraq and Iran, as part of an "axis of evil." The showdown intensified last October, when U.S. Assistant Secretary of State James Kelly visited Pyongyang to present evidence, gathered mainly by spy satellites, that North Korea was secretly engaged in a nuclear

REUTERS NEWMEDIA / CORBIS

arms program and also in testing long-range missiles, in clear violation of the 1994 Framework. The North Koreans shocked the Americans by admitting the existence of a weapons program on which they had been working even before Bush came to office.

When the United States decided to suspend the fuel-oil shipments a month after Kelly visited Pyongyang, the crisis gathered steam. In December, North Korea announced it was reactivating a nuclear-power plant that had been shut down in 1994. In January, the regime pulled out of the Nuclear Non-Proliferation Treaty. Since then, North Korean officials have claimed that they are reprocessing plutonium-laden spent-fuel rods into enough weapons-grade material to build several bombs a year. And in a brief negotiating session sponsored by the Chinese in Beijing in April, the North Koreans warned the Americans that unless the United States was prepared to offer a nonaggression pact and massive economic aid, Pyongyang reserved the right to test, deploy and perhaps even export part of its nuclear arsenal. President Bush has called the North Korean position tantamount to blackmail. And State Department spokesman Richard Boucher has said the United States will not "pay for the elimination of nuclear-weapons programs that never should have been there in the first place."

Meanwhile, Washington's relations with Seoul have been strained. A new South Korean president, Roh Moo Hyun, won election this past December riding a wave of anti-Americanism. Many voters, especially younger constituents, are determined to see their country take charge of its foreign policy and emerge from America's shadow. Last year, two South Korean girls in the town of Uijeongbu were fatally crushed by an American armored vehicle, and the crew was later exonerated by a U.S. military tribunal. The incident prompted speculation that the new government would ask the United States to relocate many of the 37,000 troops stationed in South Korea.

More recently—since coalition forces removed Saddam Hussein from power and President Roh visited Washington—tensions between Washington and Seoul seem to be easing; the North Koreans and Americans have for the time being opted to negotiate an end to the nuclear crisis. But enthusiasm for the Sunshine Policy has waned. South Koreans have been dismayed by charges that former president Kim Dae Jung, who won a Nobel Peace Prize for launching the Sunshine Policy, authorized the secret payment of hundreds of millions of dollars to Kim Jong Il to arrange their 2000 summit in Pyongyang. "Kim Dae Jung has fallen into disgrace; no doubt about it," says Yoon Tae-hee, the university president. Many South Koreans no longer trust Kim Jong Il over the nuclear issue, despite his regime's avowals that any atomic arsenal would be entirely directed at security threats from the United States. "People find it harder to believe that he would never use nuclear weapons on his fellow Koreans in the South," says Yoon. "After all, he hasn't demonstrated much concern about millions of his citizens dying of starvation."

Still, many South Koreans seem committed to using their nation's resources to induce a more accommodating attitude in Pyongyang and prevent the North's collapse. "North Korea is very definitely facing famine again," says economist Noland. By contrast, South Korea, after four decades of miraculous growth, is on the verge of becoming one of the world's wealthiest nations.

Kim Jong Il (above) became dictator of the North upon the death of his father, Kim Il Sung, in 1994, and soon proved no less adept at self-deification. Korean scholar Kongdan Oh told the Washington Post recently: "It's a cult of personality like nothing in history."

The basic ingredients of the South's economic miracle have long been in place: a strong emphasis on education, the creation of export-oriented industries and the concentration of economic power in a few large conglomerates. More recently, after an Asian economic crisis in the late 1990s, South Korea has opened up its markets to foreign investors, removed barriers to imports and, most notably, says Tufts economist Kim, "encouraged a huge jump in consumer spending."

LIKE SO MANY VISITORS to Seoul, which can only be described as an over-energized metropolis, I longed for a quiet interlude. Several restored medieval palaces in the city—each a complex of ornate buildings set on expansive grounds—seemed promising retreats. They also offer some of the few examples of traditional Korean architecture in a city whose past has been largely erased. Locals often say that if there is time to see only one palace, it should be Gyeongbokgung. Today's 19th-century structure, built on a site dating from 1395, has massive,

AFP / CORBIS

multitiered roofs of tile and wood. Like other palaces, Gyeongbokgung is divided between buildings that once housed state activities and a residential area with quarters for the king and queen and their entourages.

Adjacent to Gyeongbokgung is the National Museum, with its collection of 240,000 art objects from ancient times through the early 20th century. I'm particularly drawn to the many superb ceramics, among them seventh-century Paekche tiles, depicting supernatural guardians, that were embedded in the walls at palace entrances; early 12th-century celadon wares, beautifully glazed in subtle blue-greens and gray-greens; 14th-century porcelains decorated with bamboo, plum blossom, orchid and chrysanthemum motifs; and elegant white porcelain vases from the Choson dynasty (1392-1910).

But on two visits to the museum, I find myself sandwiched between columns of children on school outings, and solace eludes me. Nearby, the 79-acre Secret Garden of Changdeokgung, another royal palace, built in 1405, is more tranquil. But only group visits are permitted, and the tour guide, while informative, keeps us moving at too brisk a pace to really enjoy the pavilions and ginkgo groves.

Koreans yearn for reunification (a desire symbolized by a Seoul war-memorial sculpture depicting two brothers, from North and South, meeting on a 1950s battlefield). President Roh aspires to extend prosperity (dramatically visible in Seoul, opposite) to all.

Eventually, I repair to a teahouse called Dadamsun, on a narrow, curving street hard by Insadong, a district famous for art galleries and shops selling folkcraft. "Dadamsun" is a contraction of Chinese characters that mean, according to the owner, "Drinking tea encourages poetry and Zen." Offering only a single room with a table looking out on a tiny garden, Dadamsun provides a perfect setting to enjoy a traditional tea service and quiet conversation—in this case with a friend, Robin Chon, who is an interior designer.

We sit cross-legged on the floor by our table. The *paengju*, or tea maker, dressed in a long silk robe, offers us a menu of more than 20 varieties of tea. I choose a Chinese tea whose leaves have been allowed to ferment naturally in a bamboo box for 30 years. From an intensely heated stone pot, the paengju ladles boiling water into a small ceramic tea vessel and then pours more steaming water over the outside of the vessel, to keep it near boiling as the tea brews. The first brew is tossed out because it contains dust and other detritus that clung to the tea leaves during the tea's long fermentation. Over several subsequent brews, we savor the rich, earthy taste of the dark red tea. The heated floor, a tradition in Korean houses, keeps my legs from cramping and adds to the tea's comforting effect.

Chon was a member of the design team who, in 1994, installed a permanent exhibition on Korean War refugees for the museum at the War Memorial of Korea. She spent months reading histories, periodicals and personal diaries in preparation for the project. "The hardest part was dealing with the ex-military people who run the museum—they are very bureaucratic," she tells me. But in the end, the administrators agreed on an installation that would draw attention to the everyday life and suffering of noncombatants, instead of emphasizing battlefield heroism.

Much of the museum space is devoted to weaponry, including tanks and aircraft, exhibitions that attract only a trickle of viewers. Equally empty is an auditorium that continuously screens wartime newsreels describing key battles against the North's invading army.

Far more popular are the dioramas and life-size wax sculptures, installed by Chon and her team that depict the misery of civilians caught in the conflict 50 years ago. There are shelters made of broken bricks, straw, tin cans, carton boxes and other flotsam of a war-shattered country. There are refugees hovering together over a common pot of gruel . . . an exhausted porter collapsed over his A-frame . . . a woman grieving at the news that her husband is dead, while her child looks up at her fearful but uncomprehending.

I follow a troop of wide-eyed 10-year-old Boy Scouts as they tour the exhibit. When I ask their scoutmaster why they seem so much more interested in this part of the museum than in the military displays, he tells me the kids find on-line computer and video games much more riveting than the old war footage. The realistic portrayal of poverty, however, is something they haven't encountered or thought much about before. Just then, a boy approaches us with a question about an old woman shown scavenging for food. The scoutmaster translates for me: "He wants to know if it's really possible that his grandmother lived like that." ○

JEROME MING / CORBIS SABA; P. 49 BLAINE HARRINGTON III

LIKE SOME 24-carat Band-Aid, the finely worked gold plaque, inscribed with animal-headed gods and a giant eye, once covered an incision in the abdomen of Psusennes I of Egypt's 21st Dynasty. Through the cut 3,000 years ago, embalmers removed the pharaoh's internal organs for safekeeping; the king would need them again in the afterlife. The plaque's mysterious eye certified that no evil spirits had entered the pharaoh's body.

When found in 1939, the mummy of the dead king, who reigned from 1039-991 B.C., was fairly heaped with such amulets—bangles, armbands, rings, and a fabulous pectoral of gleaming gold, turquoise and lapis lazuli. Even his toes were protected by thimbles of gold. For good measure, the mummy lay in a silver coffin, inscribed with hieroglyphic texts of protective spells, inside a basalt coffin that, in turn, was sealed in an immense red-granite sarcophagus.

Egyptian art was always both beautiful and, in a magical sense, useful. These dual characteristics are the hallmarks of a gorgeous five-year traveling exhibition now on view through September 14 at the Kimbell Art Museum in Fort Worth, Texas. Psusennes' plaque, pectoral and "toe

The text of the Amduat, detailing a pharaoh's journey through the underworld, adorns Thutmose III's c. 1425 B.C. burial chamber (a replica, right). A gold mask (above) covered the face of a courtier in Psusennes I's tomb.

Egypt's Crowning Glory

New Kingdom customs rise triumphantly from the dead in "The Quest for Immortality," a dazzling display of treasures from the tombs of the pharaohs

BY DOUG STEWART

stalls," as the gold thimbles are called, are among 115 objects on loan from the government of Egypt for "The Quest for Immortality: Treasures of Ancient Egypt," which opened last summer at the National Gallery of Art in Washington, D.C. and travels from Fort Worth to the New Orleans Museum of Art, where it will be from October 19 through February 25, 2004. Nearly all the objects in the show come from the Egyptian Museum in Cairo, which recently celebrated its centennial. The new exhibition is twice the size of the 1976 blockbuster of Egyptian art, "Treasures of Tutankhamun," also loaned from the Cairo museum.

"The Quest for Immortality" focuses largely on the New Kingdom (1550-1069 B.C.), Egypt's grand imperial age. Beginning with the 18th Dynasty, this 500-year span was the era of ancient Egypt's greatest wealth and power, when the empire's army dominated a territory stretching from Syria to Sudan. The heart of the kingdom was Thebes, now Luxor, 400 miles up the Nile from the old capital of Memphis, now Cairo. Tribute from neighbors who chose not to fight, and spoils of war from those who did (and invariably lost), flowed into Egypt and its cosmopolitan new capital. The booty enriched the pharaohs, their courtiers, and the temples and priests of Amun, who became the nation's central deity.

The New Kingdom's affluent and fashion-conscious elite were probably history's first leisure class. A highlight of the show is a late 18th-Dynasty limestone statue (c. 1336-1323 B.C.) of the wife—her name is lost to history—of the renowned General Nakhtmin. With the eyes and cheekbones of a fashion model, the young woman wears a formfitting dress of pleated linen and an enormous wig with cascades of individually crimped braids ending in tassels (p. 57). Like most of the objects in the show, the sculpture was found in a tomb—in this case, the couple's—where placing images of the deceased was a pious act.

"People started preparing for the next world as soon as they could afford to," says the show's curator, Betsy Bryan, who chairs the Near Eastern Studies department at Johns Hopkins University in Baltimore. "They bought coffins, statues, you name it, from the time they were young marrieds, and stored them in their homes. When they invited people over, everybody knew exactly what they had and how good the quality was." The New Kingdom elite could have it both ways: behaving devoutly while consuming conspicuously.

Because so much of the finery we know from ancient Egypt came from tombs, it's hard to say what was worn in life and what was designed only for the crypt. Either way, jewelry and cosmetics were imbued with magical powers. The exhibition includes a gold bracelet (c. 1550-1525 B.C.), inlaid with precious stones and shaped like a vulture, that was found on the mummy of Queen Ahhotep, mother of New Kingdom founder King Ahmose. Inside her gilded wooden coffin, and probably in life as well, Ahhotep wore the bracelet, Bryan says, to identify herself with the great sky goddesses, such as Nekhbet and Nut, who took the form of vultures spreading their wings across the sky to provide a path for the sun to follow on its daily travels. Like the jackal-headed god Anubis, Nekhbet was a protector of the dead. Thus animals that normally preyed on corpses became, in the Egyptian pantheon, their guardians.

The inside of the lid of the coffin (right) of Paduamen, a priest who lived c. 1069-945 B.C., bears the image of Osiris, god of the underworld. Paduamen himself is depicted on the lid's elaborate exterior (left). He holds an Isis knot, a symbol of protection, in one hand.

Some adornments were clearly designed strictly for the tomb. A heavy plaque of hammered gold from around 1000 B.C. depicting the winged goddess Maat was probably once affixed to a royal mummy. A reassuring symbol of harmony and natural order, Maat accompanied the sun on its daily cycle, hence the sun above her head. Egyptians believed the goddess would make their passage through the afterworld as smooth and predictable as the daily sunrise. A more ostentatious example of funerary gold is the mummy mask of Wenudjebauendjed, a courtier in the reign of Psusennes I (p. 50). To ancient Egyptians, gold, luminous as the sun, was the "flesh of the gods."

Something more than masks and amulets, however, was needed to protect the flesh of the deceased from decay. Egyptian embalmers worked for 70 carefully scripted days to prepare a mummy. "First, by means of a bent iron instrument inserted through the nostrils they extract the brains," a fascinated eyewitness, the Greek historian Herodotus, wrote in the fifth century B.C. The body was cleaned out, dried in a bed of natron salts, and carefully groomed. By the 19th Dynasty, the lungs, stomach, liver and intestines of royalty were mummified separately, then sealed in jars; the heart, believed to be the seat of thought and action, stayed put. Embalmers charged different rates for different levels of service. A deluxe mummification could involve artificial eyes and hair extensions. For the poor, the body was simply allowed to dry out, then swaddled in linen bandages.

A frequent contributor, author DOUG STEWART wrote about the British Museum's "Eternal Egypt" exhibition (now at the Field Museum in Chicago) for the June 2001 issue of SMITHSONIAN.

P. 50 EGYPTIAN MUSEUM, CAIRO; PP. 50,51 ROB SHELLEY / NATIONAL GALLERY OF ART, WASHINGTON DC

Minor nobles, too, were decked out for the afterlife. A detail (above) from the c. 1295-1186 B.C. coffin of Khonsu, son of an artisan who worked on the royal tombs, shows the jackal-headed Anubis completing the embalming process. A protective amulet, the gold c. 1000 B.C. *wedjat*-eye plaque (below) was found on King Psusennes I.

PP 52-53 EGYPTIAN MUSEUM, CAIRO (4)

Egyptian kings didn't have to worry about how they'd get around in the afterlife. Boats, both full-size and models, were placed in their tombs to provide transport. A wooden model, nearly eight feet long (detail, above), was found in the tomb of Amenhotep II (1427-1400 B.C.). Two steering oars were at the stern, which was painted with scenes of the king trampling foes from the Levant and Nubia.

Egyptians pictured the deceased's destination as a Nile Valley with taller crops, easier work and unlimited beer. "Being dead was just one of the modes of existence, but a finer one," says Lawrence Berman, curator of ancient Egyptian, Nubian and Near Eastern art at Boston's Museum of Fine Arts. "You were more perfect when you were dead. After you were mummified, you had a stronger, better body."

Being literal-minded about the afterlife, both royalty and commoners arranged to cram their tombs with as many household objects as possible: food, drink, linen, cosmetics, mirrors, even toys and board games. Tomb food could be a fresh-killed duck, a picture or hieroglyph of a duck, a container shaped like a duck, or a mummified duck. Servants, as essential in the afterlife as before it, were represented in royal tombs by small funerary statues known as *ushebtis*.

Underground tombs were sealed after a funeral, but ground-level offering chapels remained open to mourners, pilgrims and even early tourists, who came to admire the surroundings and say prayers. Families of the dead could contract with priests to deliver meals to the chapel to sustain the departed. "The food would be offered up symbolically to the image of the deceased, who would sort of inhale it magically," says Berman. "Then the priests would consume it themselves." In a land without coinage, offerings were a priest's wages.

To curry favor with the gods, many Egyptians commissioned statues attesting to their piety to be placed in prominent temples. One such object features a pair of well-fed crocodiles and an official in a prayerful pose. It was found in the temple of Sobek, the crocodile deity. Priests there may even have bred live crocodiles for ritual use. By the Ptolemaic period, which began in the fourth century B.C., visitors eager to please feline deities, such as Bastet and Sakhmet, paid to have mummified cats (some in small bronze coffins) placed in temples honoring the cat gods. The temples' priests were savvy fund-raisers. To meet demand, they bred, slaughtered and embalmed kittens by the thousands.

Egypt's dizzyingly complex religious rites were based on a cycle of death and rebirth. Re, the sun god, it was believed, died each night only to be reborn each morning. When mortals died, whether noble or common, they joined Re on his nocturnal journey through the underworld; at dawn, if all went well, they emerged immortal. Pharaohs, unlike com-

PP. 54-55 EGYPTIAN MUSEUM, CAIRO (3)

moners and most nobles, made the trip every night as a fully divine member of the sun-boat's crew. The cycle was like so much of life in Egypt, from the annual flooding of the Nile to the ripening of fruits and grains each winter. Rebirth was not reincarnation, however. The god of the underworld, Osiris (supposedly the first Egyptian king to be mummified), was always portrayed in Egyptian art as a mummiform deity. Although he would be reborn each day at dawn, in portrayals he remained wrapped as tightly as a man in a full body cast.

Egyptians imagined their own mummification as a temporary phase before immortality, but the various books of the dead didn't spell out precisely how long the bandages stayed on. According to one text, the magical journey through the night could take as long as several earthly lifetimes. But although a mummy's body was tightly confined, its soul, at least, was mobile. A stone carving from the tomb of a royal scribe during the New Kingdom shows a human-headed bird perched on a mummy's bier, gazing beseechingly at its master, like a forlorn pet. The bird represents the *ba*, a facet of the mummy's soul. Each day, it was thought, the ba would fly up the burial shaft and out into the sunlit world. At sunset, it would return to spend the night perched by the mummy. In this way, the ba-bird kept its master in touch with the world.

A reigning pharaoh was the closest thing to a divinity on earth; Egyptians referred to living pharaoh as a "young god"—an intermediary between them and their all-powerful deities. For their part, rulers lavished the Theban temples with offerings—of gold, silver, slaves and more—to thank the gods for their own good fortune.

An image of the funerary god Anubis, lord of embalming, tops the wooden canopic chest (above) of Queen Nedjmet. Made about 1080 B.C., it once held jars containing organs removed during her mummification.

The ambitious Queen Hatshepsut, who was particularly extravagant in her offerings, had good reason to be thankful. She was both Thutmose II's principal wife and, as a daughter of Thutmose I, his half sister. (Incest was common in Egyptian royal families; it simplified lines of succession.) After her husband's death in 1479 B.C., Hatshepsut elbowed aside her young stepson-nephew, Thutmose III, to become pharaoh in her own right, although during her nearly 15-year reign, she was officially his co-regent. She justified the power play in inscriptions carved in her enormous, multi-terraced mortuary temple near Thebes. The god Amun had not only chosen her to be the next pharaoh, she declared, but had also impregnated her mother, Queen Ahmose, years before to effect her divine birth.

Hatshepsut erected obelisks at the temple of Karnak to honor Amun and covered them with precious electrum, a mixture of gold and silver. "I measured it by the gallon like sacks of grain," she asserted in an inscription on the base. "Not shall he who hears it say, 'It is a boast,' what I have said. Rather say, 'How like her it is. She is devoted to her father!'"—meaning the god Amun, not King Thutmose I.

By the time his imperious stepmother died, circa 1458 B.C., Thutmose III was in his 20s. He ordered her self-serving inscriptions covered up or hacked away, along with any appearance of her name or image, and he set about building a new series of obelisks

Exquisite funerary accoutrements have been found in burial chambers: Beetles, associated with the rising sun and regeneration, were regarded as sacred by the ancient Egyptians. The scarab (left, made of glass and gold, c. 332-30 B.C.) symbolized resurrection. The eye of Horus (center, on a cloisonné bracelet of lapis lazuli and carnelian, c. 945-924 B.C.) signified good health. The goddess Hathor (right, on a pendant of carved lapis, echoing the color of the sky, c. 850 B.C.) protected the sun god on his underworld journey.

"My majesty detests falsehood," asserted the pharaoh Thutmose III (left, as a stone sphinx from the temple of Karnak; right, in a relief with the partially obscured god Amun; and, below, as a wooden statue found in his plundered tomb). "It is not in me to weave tall tales." A great military leader, Thutmose, king from 1479-1425 B.C., was one ruler who didn't have to embellish his achievements.

detailing his own divine birth. (Among them are the misnamed Cleopatra's Needle, now in London, and monuments in New York City's Central Park and Istanbul's Hippodrome.) A painted relief (above, right) in the exhibition shows Thutmose and his otherworldly father, Amun, nose to nose like twins. This time, however, it's the god who's been all but obliterated—a victim of King Akhenaten, whose short-lived campaign a century later for a new central deity, Aten, led to widespread defacement of Amun's image.

Thutmose III, who stood just 5 feet 2 inches tall to judge from his mummy, mounted at least 14 foreign military campaigns, some of which he led personally, all of which he won. His military exploits were recorded by contemporaries, including a lengthy account carved into rock walls at Karnak. There are tales of his soldiers hiding in baskets delivered to an enemy city, of his ordering a fleet of boats hauled 250 miles overland by oxen for a surprise raid across the Euphrates on the Mittani Empire, and of a victorious elephant hunt afterward. A painted fragment portraying Thutmose's royal bark shows a hull decorated with two scenes of the king: one as a warrior smiting an Asiatic, the other as a sphinx trampling a Nubian. Pharaohs returning from battle sometimes heaved into port with the bodies of vanquished princes dangling from the bows. By all accounts, Thutmose was more compassionate. He neither enslaved enemy chiefs nor massacred their subjects, preferring to bring foreign princes into line by taking their sons hostage and raising them as loyal Egyptians.

His heroic achievements notwithstanding, Thutmose wanted to make sure his passage to the next world went smoothly. To that end, he had the walls of his burial chamber painted with a minutely illustrated, hour-by-hour guide—the Amduat—for his posthumous nightly journey through the underworld with the sun god Re. Every obstacle on the route is meticulously la-

TOP AND BOTTOM: EGYPTIAN MUSEUM, CAIRO (2); SUPREME COUNCIL OF ANTIQUITIES, DEIR EL-BAHARI

The anonymous wife of Nakhtmin, a high-ranking military officer, was immortalized in limestone (left), arrayed in the height of 18th-Dynasty fashion—sheer, finely pleated linen and an elaborately crimped and braided wig. A small wooden chair (right) was found with a pillow stuffed with pigeon feathers; it was likely made for Princess Sit-Amun, daughter of Amenhotep III and Queen Tiye.

beled. In ancient Egypt, to name a thing was to master it.

Despite his painstaking preparations, however, Thutmose III's afterlife was not happy. His tomb, once probably far richer than Tutankhamun's, was plundered in antiquity. When archaeologists discovered it in the Valley of the Kings in 1898, about all that was left was a wooden statue of the king, a beautifully modeled leopard on the prowl, and the royal sarcophagus, empty. Thutmose's tattered mummy had turned up a few years earlier, in 1881; it had been hidden by priests some time after the New Kingdom in an underground cache not far away, stacked with dozens of other royal mummies. Thutmose's had a large hole hacked in its chest (most likely by an impatient jewelry thief).

Fortunately, the enchanting Amduat on the walls of his tomb fared better and has been exactingly reproduced, blemishes and all, in a life-size replica of the king's 50-by-29-by-10-foot burial chamber for the current exhibition. "Other than the fact that the tomb in the show is air-conditioned and the one in the Valley of the Kings is about 120 degrees, you can't tell them apart," says Mark Leithauser, the National Gallery's design director.

With its almost cartoonish combination of stick figures and red and black text, Thutmose III's Amduat is unlike the careful hieroglyphics we're used to seeing carved in stone. Later in the New Kingdom, as funerary texts became more common in tombs of any citizen of means, pharaohs insisted upon elaborate, full-color Amduats.

In Thutmose's Amduat, the deceased king travels as one with Re on a perilous boat trip through the 12 symbolic hours of night. In hour four, the river of the underworld dries up, and the boat becomes a snake, the better to slither over sand. In hour seven, helpful deities decapitate Re's enemies and, four hours later, toss their body parts into flaming pits. At dawn, acclaimed by a crowd of deities (the Amduat includes more than 700), a scarab, symbol of regeneration, nudges the sun out of the underworld toward the arms of Shu, god of the air. A new day begins; a dead pharaoh is reborn.

Indeed, to judge from today's enduring fascination with ancient Egypt and the superb art it created to put the next world in reach, Thutmose III and the other mighty New Kingdom pharaohs are enjoying something very much like eternal life after all. ○

EGYPTIAN MUSEUM, CAIRO (2)

The enigmatic Confederate general led the fateful Battle of Gettysburg 140 years ago this month. It was not his finest hour

BY ROY BLOUNT, JR.

Making Sense of Robert E. Lee

"IT IS WELL that war is so terrible, or we should grow too fond of it." —ROBERT E. LEE, AT FREDERICKSBURG

Few figures in American history are more divisive, contradictory or elusive than Robert E. Lee, the reluctant, tragic leader of the Confederate Army, who died in his beloved Virginia at age 63 in 1870, five years after the end of the Civil War. In a new biography, Robert E. Lee, *Roy Blount, Jr., treats Lee as a man of competing impulses, a "paragon of manliness" and "one of the greatest military commanders in history," who was nonetheless "not good at telling men what to do."*

Blount, a noted humorist, journalist, playwright and raconteur, is the author or coauthor of 15 previous books and the editor of Roy Blount's Book of Southern Humor. *A resident of New York City and western Massachusetts, he traces his interest in Lee to his boyhood in Georgia. Though Blount was never a Civil War buff, he says "every Southerner has to make his peace with that War. I plunged back into it for this book, and am relieved to have emerged alive."*

"Also," he says, "Lee reminds me in some ways of my father."

At the heart of Lee's story is one of the monumental choices in American history: revered for his honor, Lee resigned his U.S. Army commission to defend Virginia and fight for the Confederacy, on the side of slavery. "The decision was honorable by his standards of honor—which, whatever we may think of them, were neither self-serving nor complicated," Blount says. Lee "thought it was a bad idea for Virginia to secede, and God knows he was right, but secession had been more or less democratically decided upon." Lee's family held slaves, and he himself was at best ambiguous on the subject, leading some of his defenders over the years to discount slavery's significance in assessments of his character. Blount argues that the issue does *matter: "To me it's slavery, much more than secession as such, that casts a shadow over Lee's honorableness."*

In the excerpt that follows, the general masses his troops for a battle over three humid July days in a Pennsylvania town. Its name would thereafter resound with courage, casualties and miscalculation: Gettysburg.

IN HIS DASHING (if sometimes depressive) antebellum prime, he may have been the most beautiful person in America, a sort of precursor-cross between Cary Grant and Randolph Scott. He was in his element gossiping with belles about their beaux at balls. In theaters of grinding, hellish human carnage he kept a pet hen for company. He had tiny feet that he loved his children to tickle. None of these things seems to fit, for if ever there was a grave American icon, it is Robert Edward Lee—hero of the Confederacy in the Civil War and a symbol of nobility to some, of slavery to others.

After Lee's death in 1870, Frederick Douglass, the former fugitive slave who had become the nation's most prominent African-American, wrote, "We can scarcely take up a newspaper . . . that is not filled with *nauseating* flatteries" of Lee, from which "it would seem . . . that the soldier who kills the most men in battle, even in a bad cause, is the greatest Christian, and entitled to the highest place in heaven." Two years later one of Lee's ex-generals, Jubal A. Early, apotheosized his late commander as follows: "Our beloved Chief stands, like some lofty column which rears its head among the highest, in grandeur, simple, pure and sublime."

In 1907, on the 100th anniversary of Lee's birth, President Theodore Roosevelt expressed mainstream American sentiment, praising Lee's "extraordinary skill as a General, his dauntless courage and high leadership," adding, "He stood that hardest of all strains, the strain of bearing himself well through the gray evening of failure; and therefore

After Lee surrendered April 9, 1865, he said to his troops: "We have fought through the war together; I have done my best for you; my heart is too full to say more." He then returned to his Richmond home, where Mathew Brady took this photograph.

HAND-COLORED PHOTOGRAPH: GRANGER COLLECTION, NEW YORK

Lee's father, Maj. Gen. "Light-Horse Harry" Lee (left) fought in the Revolutionary War. Both his mother, Ann Hill Carter (center left), and his wife, Mary Lee Custis (center right), were Virginia gentry. Lee (right, in his late 30s, with son Rooney) had seven children.

out of what seemed failure he helped to build the wonderful and mighty triumph of our national life, in which all his countrymen, north and south, share."

We may think we know Lee because we have a mental image: gray. Not only the uniform, the mythic horse, the hair and beard, but the resignation with which he accepted dreary burdens that offered "neither pleasure nor advantage": in particular, the Confederacy, a cause of which he took a dim view until he went to war for it. He did not see right and wrong in tones of gray, and yet his moralizing could generate a fog, as in a letter from the front to his invalid wife: "You must endeavour to enjoy the pleasure of doing good. That is all that makes life valuable." All right. But then he adds: "When I measure my own by that standard I am filled with confusion and despair."

His own hand probably never drew human blood nor fired a shot in anger, and his only Civil War wound was a faint scratch on the cheek from a sharpshooter's bullet, but many thousands of men died quite horribly in battles where he was the dominant spirit, and most of the casualties were on the other side. If we take as a given Lee's granitic conviction that everything is God's will, however, he was born to lose.

As battlefield generals go, he could be extremely fiery, and could go out of his way to be kind. But in even the most sympathetic versions of his life story he comes across as a bit of a stick—certainly compared with his scruffy nemesis, Ulysses S. Grant; his zany, ferocious "right arm," Stonewall Jackson; and the dashing "eyes" of his army, J.E.B. "Jeb" Stuart. For these men, the Civil War was just the ticket. Lee, however, has come down in history as too fine for the bloodbath of 1861-65. To efface the squalor and horror of the war, we have the image of Abraham Lincoln freeing the slaves, and we have the image of Robert E. Lee's gracious surrender. Still, for many contemporary Americans, Lee is at best the moral equivalent of Hitler's brilliant field marshal Erwin Rommel (who, however, turned against Hitler, as Lee never did against Jefferson Davis, who, to be sure, was no Hitler).

From *Robert E. Lee* by Roy Blount, Jr., copyright (c) 2003. Reprinted by permission of Lipper/Viking, a member of the Penguin Group (USA) Inc.

On his father's side, Lee's family was among Virginia's and therefore the nation's most distinguished. Henry, the scion who was to become known in the Revolutionary War as Light-Horse Harry, was born in 1756. He graduated from Princeton at 19 and joined the Continental Army at 20 as a captain of dragoons, and he rose in rank and independence to command Lee's light cavalry and then Lee's legion of cavalry and infantry. Without the medicines, elixirs, and food Harry Lee's raiders captured from the enemy, George Washington's army would not likely have survived the harrowing winter encampment of 1777-78 at Valley Forge. Washington became his patron and close friend.

With the war nearly over, however, Harry decided he was underappreciated, so he impulsively resigned from the army. In 1785, he was elected to the Continental Congress, and in 1791 he was elected governor of Virginia. In 1794 Washington put him in command of the troops that bloodlessly put down the Whiskey Rebellion in western Pennsylvania. In 1799 he was elected to the U.S. Congress, where he famously eulogized Washington as "first in war, first in peace, and first in the hearts of his countrymen."

Meanwhile, though, Harry's fast and loose speculation in hundreds of thousands of the new nation's acres went sour, and in 1808 he was reduced to chicanery. He and his second wife, Ann Hill Carter Lee, and their children departed the Lee ancestral home, where Robert was born, for a smaller rented house in Alexandria. Under the conditions of bankruptcy that obtained in those days, Harry was still liable for his debts. He jumped a personal appearance bail—to the dismay of his brother, Edmund, who had posted a sizable bond—and wangled passage, with pitying help from President James Monroe, to the West Indies. In 1818, after five years away, Harry headed home to die, but got only as far as Cumberland Island, Georgia, where he was buried. Robert was 11.

Robert appears to have been too fine for his childhood, for his education, for his profession, for his marriage, and for the Confederacy. Not according to him. According to him, he was not fine enough. For all his audacity on the battlefield,

ROBERT E. LEE MEMORIAL ASSOCIATION, STRATFORD; WASHINGTON AND LEE UNIVERSITY; WASHINGTON AND LEE UNIVERSITY, WASHINGTON-CUSTIS-LEE COLLECTION; VIRGINIA HISTORICAL SOCIETY

he accepted rather passively one raw deal after another, bending over backward for everyone from Jefferson Davis to James McNeill Whistler's mother. (When he was superintendent of the U.S. Military Academy, Lee acquiesced to Mrs. Whistler's request on behalf of her cadet son, who was eventually dismissed in 1854.)

By what can we know of him? The works of a general are battles, campaigns and usually memoirs. The engagements of the Civil War shape up more as bloody muddles than as commanders' chess games. For a long time during the war, "Old Bobbie Lee," as he was referred to worshipfully by his troops and nervously by the foe, had the greatly superior Union forces spooked, but a century and a third of analysis and counter-analysis has resulted in no core consensus as to the genius or the folly of his generalship. And he wrote no memoir. He wrote personal letters—a discordant mix of flirtation, joshing, lyrical touches, and stern religious adjuration—and he wrote official dispatches that are so impersonal and (generally) unself-serving as to seem above the fray.

During the postbellum century, when Americans North and South decided to embrace R. E. Lee as a national as well as a Southern hero, he was generally described as antislavery. This assumption rests not on any public position he took but on a passage in an 1856 letter to his wife. The passage begins: "In this enlightened age, there are few I believe, but what will acknowledge, that slavery as an institution, is a moral & political evil in any Country. It is useless to expatiate on its disadvantages." But he goes on: "I think it however a greater evil to the white than to the black race, & while my feelings are strongly enlisted in behalf of the latter, my sympathies are more strong for the former. The blacks are immeasurably better off here than in Africa, morally, socially & physically. The painful discipline they are undergoing, is necessary for their instruction as a race, & I hope will prepare & lead them to better things. How long their subjugation may be necessary is known & ordered by a wise Merciful Providence."

The only way to get inside Lee, perhaps, is by edging fractally around the record of his life to find spots where he comes through; by holding up next to him some of the fully realized characters—Grant, Jackson, Stuart, Light-Horse Harry Lee, John Brown—with whom he interacted; and by subjecting to contemporary skepticism certain concepts—honor, "gradual emancipation," divine will—upon which he unreflectively founded his identity.

He wasn't always gray. Until war aged him dramatically, his sharp dark brown eyes were complemented by black hair ("ebon and abundant," as his doting bi-

MEDFORD HISTORICAL SOCIETY COLLECTION / CORBIS (2)

On June 28, 1863, Lincoln put Maj. Gen. George G. Meade (above) in command of the Army of the Potomac. Three days later, the battle was joined in Gettysburg (below), a town of 2,400, where Lee tragically underestimated the strength of Meade's dug-in troops.

ographer Douglas Southall Freeman puts it, "with a wave that a woman might have envied"), a robust black mustache, a strong full mouth and chin unobscured by any beard, and dark mercurial brows. He was not one to hide his looks under a bushel. His heart, on the other hand . . . "The heart, he kept locked away," as Stephen Vincent Benét proclaimed in "John Brown's Body," "from all the picklocks of biographers." Accounts by people who knew him give the impression that no one knew his whole heart, even before it was broken by the war. Perhaps it broke many years before the war. "You know she is like her papa, always wanting something," he wrote about one of his daughters. The great Southern diarist of his day, Mary Chesnut, tells us that when a lady teased him about his ambitions, he "remonstrated—said his tastes were of the simplest. He only wanted a Virginia farm—no end of cream and fresh butter—and fried chicken. Not one fried chicken or two—but unlimited fried chicken." Just before Lee's surrender at Appomattox, one of his nephews found him in the field, "very grave and tired," carrying around a fried chicken leg wrapped in a piece of bread, which a Virginia countrywoman had pressed upon him but for which he couldn't muster any hunger.

One thing that clearly drove him was devotion to his home state. "If Virginia stands by the old Union," Lee told a friend, "so will I. But if she secedes (though I do not believe in secession as a constitutional right, nor that there is sufficient cause for revolution), then I will follow my native State with my sword, and, if need be, with my life."

The North took secession as an act of aggression, to be countered accordingly. When Lincoln called on the loyal states for troops to invade the South, Southerners could see the issue as defense not of slavery but of homeland. A Virginia convention that had voted 2 to 1 against secession, now voted 2 to 1 in favor.

When Lee read the news that Virginia had joined the Confederacy, he said to his wife, "Well, Mary, the question is settled," and resigned the U.S. Army commission he had held for 32 years.

THE DAYS OF JULY 1-3, 1863, still stand among the most horrific and formative in American history. Lincoln had given up on Joe Hooker, put Maj. Gen. George G. Meade in command of the Army of the Potomac, and sent him to stop Lee's invasion of Pennsylvania. Since Jeb Stuart's scouting operation had been uncharacteristically out of touch, Lee wasn't sure where Meade's army was. Lee had actually advanced farther north than the town of Gettysburg, Pennsylvania, when he learned that Meade was south of him, threatening his supply lines. So Lee swung back in that direction. On June 30 a Confederate brigade, pursuing the report that there were shoes to be had in Gettysburg, ran into Federal cavalry west of town, and withdrew. On July 1 a larger Confederate force returned, engaged Meade's advance force, and pushed it back through the town—to the fishhook-shaped heights comprising Cemetery Hill, Cemetery Ridge, Little Round Top, and Round Top. It was almost a rout, until Maj. Gen. O. O. Howard, to whom Lee as West Point superintendent had been kind when Howard was an unpopular cadet, and Maj. Gen. Winfield Scott Hancock rallied the Federals and held the high ground. Excellent ground to defend from. That evening Lt. Gen. James Longstreet, who commanded the First Corps of the Army of Northern Virginia, urged Lee not to attack, but to swing around to the south, get between Meade and Washington, and find a strategically even better defensive position, against which the Federals might feel obliged to mount one of those frontal assaults that virtually always lost in this war. Still not having heard from Stuart, Lee felt he might have numerical superiority for once. "No," he said, "the enemy is there, and I am going to attack him there."

The next morning, Lee set in motion a two-part offensive: Lt. Gen. Richard Ewell's corps was to pin down the enemy's right flank, on Culp's Hill and Cemetery Hill, while Longstreet's, with a couple of extra divisions, would hit the left flank—believed to be exposed—on Cemetery Ridge. To get there Longstreet would have to make a long march under cover. Longstreet mounted a sulky objection, but Lee was adamant. And wrong.

Had Lee taken the advice of Lt. Gen. James "Old Warhorse" Longstreet, Lee might have won the critical battle.

Lee didn't know that in the night Meade had managed by forced marches to concentrate nearly his entire army at Lee's front, and had deployed it skillfully—his left flank was now extended to Little Round Top, nearly three-quarters of a mile south of where Lee thought it was. The disgruntled Longstreet, never one to rush into anything, and confused to find the left flank farther left than expected, didn't begin his assault until 3:30 that afternoon. It nearly prevailed anyway, but at last was beaten gorily back. Although the two-pronged offensive was ill-coordinated, and the Federal artillery had knocked out the Confederate guns to the north before Ewell attacked, Ewell's infantry came tantalizingly close to taking Cemetery Hill, but a counterattack forced them to retreat.

On the third morning, July 3, Lee's plan was roughly the same, but Meade seized the initiative by pushing forward on his right and seizing Culp's Hill, which the Confederates held. So Lee was forced to improvise. He decided to strike straight ahead, at Meade's heavily fortified midsection. Confederate artillery would soften it up, and Longstreet would direct a frontal assault across a mile of open ground against the center of Missionary Ridge. Again Longstreet objected; again Lee wouldn't listen. The Confederate artillery exhausted all its shells ineffectively, so was unable to support the assault—which has gone down in history as Pickett's charge because Maj. Gen. George Pickett's division absorbed the worst of the horrible bloodbath it turned into.

Lee's idolaters strained after the war to shift the blame,

CORBIS

but the consensus today is that Lee managed the battle badly. Each supposed major blunder of his subordinates—Ewell's failure to take the high ground of Cemetery Hill on July 1, Stuart's getting out of touch and leaving Lee unapprised of what force he was facing, and the lateness of Longstreet's attack on the second day—either wasn't a blunder at all (if Longstreet had attacked earlier he would have encountered an even stronger Union position) or was caused by a lack of forcefulness and specificity in Lee's orders.

Before Gettysburg, Lee had seemed not only to read the minds of Union generals but almost to expect his subordinates to read his. He was not in fact good at telling men what to do. That no doubt suited the Confederate fighting man, who didn't take kindly to being told what to do—but Lee's only weakness as a commander, his otherwise reverent nephew Fitzhugh Lee would write, was his "reluctance to oppose the wishes of others, or to order them to do anything that would be disagreeable and to which they would not consent." With men as well as with women, his authority derived from his sightliness, politeness, and unimpeachability. His usually cheerful detachment patently covered solemn depths, depths faintly lit by glints of previous and potential rejection of self and others. It all seemed Olympian, in a Christian cavalier sort of way. Officers' hearts went out to him across the latitude he granted them to be willingly, creatively honorable. Longstreet speaks of responding to Lee at another critical moment by "receiving his anxious expressions really as appeals for reinforcement of his unexpressed wish." When people obey you because they think you enable them to follow their own instincts, you need a keen instinct yourself for when they're getting out of touch, as Stuart did, and when they are balking for good reason, as Longstreet did. As a father Lee was fond but fretful, as a husband devoted but distant. As an attacking general he was inspiring but not necessarily cogent.

At Gettysburg he was jittery, snappish. He was 56 and bone weary. He may have had dysentery, though a scholar's widely

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Altogether at Gettysburg some 28,000 Confederates—more than a third of Lee's entire army—were killed, wounded, captured or missing. Meade and his Union troops were so stunned by their own losses—about 23,000—they failed to capitalize on their victory.

publicized assertion to that effect rests on tenuous evidence. He did have rheumatism and heart trouble. He kept fretfully wondering why Stuart was out of touch, worrying that something bad had happened to him. He had given Stuart broad discretion as usual, and Stuart had overextended himself. Stuart wasn't frolicking. He had done his best to act on Lee's written instructions: "You will . . . be able to judge whether you can pass around their army without hindrance, doing them all the damage you can, and cross the [Potomac] east of the mountains. In either case, after crossing the river, you must move on and feel the right of Ewell's troops, collecting information, provisions, etc." But he had not, in fact, been able to judge: he met several hindrances in the form of Union troops, a swollen river that he and his men managed only heroically to cross, and 150 Federal wagons that he captured *before* he crossed the river. And he had not sent word of what he was up to.

When on the afternoon of the second day Stuart did show up at Gettysburg, after pushing himself nearly to exhaustion, Lee's only greeting to him is said to have been, "Well, General Stuart, you are here at last." A coolly devastating cut: Lee's way of chewing out someone who he felt had let him down. In the months after Gettysburg, as Lee stewed over his defeat, he repeatedly criticized the laxness of Stuart's command, deeply hurting a man who prided himself on the sort of dashing freelance effectiveness by which Lee's father, Maj. Gen. Light-Horse Harry, had defined himself. A bond of implicit trust had been broken. Loving-son figure had failed loving-father figure and vice versa.

Confederate generals James "Jeb" Stuart (left) and George Edward Pickett saw their troops defeated by a superior Union force.

In the past Lee had also granted Ewell and Longstreet wide discretion, and it had paid off. Maybe his magic in Virginia didn't travel. "The whole affair was disjointed," Taylor the aide said of Gettysburg. "There was an utter absence of accord in the movements of the several commands."

Why did Lee stake everything, finally, on an ill-considered thrust straight up the middle? Lee's critics have never come up with a logical explanation. Evidently he just got his blood up, as the expression goes. When the usually repressed Lee felt an overpowering need for emotional release, and had an army at his disposal and another one in front of him, he couldn't hold back. And why should Lee expect his imprudence to be any less unsettling to Meade than it had been to the other Union commanders?

The spot against which he hurled Pickett was right in front of Meade's headquarters. (Once, Dwight Eisenhower, who admired Lee's generalship, took Field Marshal Montgomery to visit the Gettysburg battlefield. They looked at the site of Pickett's charge and were baffled. Eisenhower said, "The man [Lee] must have got so mad that he wanted to hit that guy [Meade] with a brick.")

Pickett's troops advanced with precision, closed up the gaps that withering fire tore into their smartly dressed ranks, and at close quarters fought tooth and nail. A couple of hundred Confederates did break the Union line, but only briefly. Someone counted 15 bodies on a patch of ground less than five feet wide and three feet long. It has been estimated that 10,500 Johnny Rebs made the charge and 5,675—roughly 54 percent—fell dead or wounded. As a Captain Spessard charged, he saw his son shot dead. He laid him out gently on the ground, kissed him, and got back to advancing.

As the minority who hadn't been cut to ribbons streamed back to the Confederate lines, Lee rode in splendid calm among them, apologizing. "It's all my fault," he assured stunned privates and corporals. He took the time to admonish, mildly, an officer who was beating his horse: "Don't whip him, captain; it does no good. I had a foolish horse, once, and kind treatment is the best." Then he resumed his apologies: "I am very sorry—the task was too great for you—but we mustn't despond." Shelby Foote has called this Lee's finest moment. But generals don't want apologies from those beneath them, and that goes both ways. After midnight, he told a cavalry officer, "I never saw troops behave more magnificently than Pickett's division of Virginians. . . . " Then he fell silent, and it was then that he exclaimed, as the officer later wrote it down, "Too bad! *Too bad!* OH! TOO BAD!"

Pickett's charge wasn't the half of it. Altogether at Gettysburg as many as 28,000 Confederates were killed, wounded, captured, or missing: more than a third of Lee's whole army. Perhaps it was because Meade and his troops were so stunned by their own losses—about 23,000—that they failed to pursue Lee on his withdrawal south, trap him against the flooded Potomac, and wipe his army out. Lincoln and the Northern press were furious that this didn't happen.

For months Lee had been traveling with a pet hen. Meant for the stewpot, she had won his heart by entering his tent first thing every morning and laying his breakfast egg under his Spartan cot. As the Army of Northern Virginia was breaking camp in all deliberate speed for the withdrawal, Lee's staff ran around anxiously crying, *"Where is the hen?"* Lee himself found her nestled in her accustomed spot on the wagon that transported his personal matériel. Life goes on.

AFTER GETTYSBURG, Lee never mounted another murderous head-on assault. He went on the defensive. Grant took over command of the eastern front and 118,700 men. He set out to grind Lee's 64,000 down. Lee had his men well dug in. Grant resolved to turn his flank, force him into a weaker position, and crush him.

On April 9, 1865, Lee finally had to admit that he was

CORBIS; PICTURE HISTORY

Lee (right) borrowed a ceremonial sword for his meeting with Grant on April 9, 1865, at a farmhouse in the village of Appomattox Court House, Virginia. Prior to the surrender, Grant said he "had no doubt about the good faith of Lee."

trapped. At the beginning of Lee's long, combative retreat by stages from Grant's overpowering numbers, he had 64,000 men. By the end they had inflicted 63,000 Union casualties but had been reduced themselves to fewer than 10,000.

To be sure, there were those in Lee's army who proposed continuing the struggle as guerrillas or by reorganizing under the governors of the various Confederate states. Lee cut off any such talk. He was a professional soldier. He had seen more than enough of governors who would be commanders, and he had no respect for ragtag guerrilladom. He told Col. Edward Porter Alexander, his artillery commander, . . . the men would become mere bands of marauders, and the enemy's cavalry would pursue them and overrun many wide sections they may never have occasion to visit. We would bring on a state of affairs it would take the country years to recover from."

"And, as for myself, you young fellows might go to bushwhacking, but the only dignified course for me would be, to go to Gen. Grant and surrender myself and take the consequences." That is what he did on April 9, 1865, at a farmhouse in the village of Appomattox Court House, wearing a full-dress uniform and carrying a borrowed ceremonial sword which he did not surrender.

Thomas Morris Chester, the only black correspondent for a major daily newspaper (the *Philadelphia Press*) during the war, had nothing but scorn for the Confederacy, and referred to Lee as a "notorious rebel." But when Chester witnessed Lee's arrival in shattered, burned-out Richmond after the surrender, his dispatch sounded a more sympathetic note. After Lee "alighted from his horse, he immediately uncovered his head, thinly covered with silver hairs, as he had done in acknowledgment of the veneration of the people along the streets," Chester wrote. "There was a general rush of the small crowd to shake hands with him. During these manifestations not a word was spoken, and when the ceremony was through, the General bowed and ascended his steps. The silence was then broken by a few voices calling for a speech, to which he paid no attention. The General then passed into his house, and the crowd dispersed." ○

APPOMATTOX COURTHOUSE NATIONAL PARK

Close Encounters of the Sneaky Kind

When it comes to mating, the brawny guy is supposed to get the girl, but biologists are finding that small, stealthy suitors do just fine

BY RICHARD CONNIFF

ILLUSTRATIONS BY JAMES O'BRIEN

SOMEWHERE IN A RAIN FOREST in Panama, a big bruiser of a dung beetle with a formidable horn on his snout stands ready to defend his turf. Let's call him Mr. Big. He is the beau ideal: not only tall, dark and handsome, but also ferocious in combat. What he's defending is, OK, howler monkey flop, but this is an insanely precious commodity for local dung beetles. They get to it 15 seconds after it hits the ground.

Under the monkey dropping, where Mr. Big stands guard, a female is sequestered in a tunnel. She's supposed to be busily packing up food for her offspring by Mr. Big. Instead, she's having sex with a dismal runt named Raoul.

What's wrong with this picture? Absolutely everything, according to our conventional notions about sexual behavior. The Mr. Bigs of the world—the beefy macho types—are supposed to get the girls. They also get to kick sand in the faces of the 98-pound Raouls. But recent research has starkly demonstrated that the conventional wisdom is all wrong. The natural world is full of what biologists call "satellite males" or "sneaker males." Many of them are relative weaklings, or lack the masculine ornamentation to dazzle choosy females. Some even practice unconventional strategies like cross-dressing. Yet surprisingly often, it's the 98-pound weakling who gets the girl.

Scientists have documented sneaker-male behavior in hundreds of species, from damselflies to Sumatran orangutans. Among red deer, for instance, a 12-point buck may be the apparent stud, defending a harem of 20 hinds. But young males with dinky little antlers loiter nearby, grabbing matings whenever they can. (British biologists refer to them as "sneaky rutters," or worse.) Similarly, an old horseshoe crab may no longer have what it takes to latch on to a female of his own. So instead, he waits to find a young couple already mating, then scrambles aboard and manages to fertilize about 40 percent of the female's eggs.

But let's go back to Raoul. Mr. Big is twice Raoul's size, with a horn that accounts for 15 percent of his body weight. Among male dung beetles, the horn is the main secondary sex characteristic and the chief weapon for head-butting combat. Raoul, by contrast, has no more than a pitiful nub where his horn's supposed to be. Having been malnourished at a crucial stage in his early development, he will never grow a respectable horn, nor ever be able to stand in the doorway of his own handsome pile defending his claim to a female. About half of all male dung beetles suffer the same sorry fate. In the old way of thinking, they could resign themselves to romantic and evolutionary oblivion.

"But nobody had looked at what goes on underground," says Douglas Emlen, a biologist at the University of Montana. He set out to change that 12 years ago, as a graduate student at the Smithsonian Tropical Research Institute in Panama. Emlen built glass-fronted ant farms, put the dung beetles inside and then watched what really happened. The smallest sneaker males, he says, relentlessly attempted to slip into the tunnel entrance while Mr. Big was looking the other way. Others, like Raoul, withdrew to a respectful distance and dug tunnels of their own. Once hidden safely underground, these sneakers veered sharply sideways to intersect the main tunnel and enjoy a tryst with Mrs. Big while Mr. Big himself stood stupidly at the door.

Emlen's supervisors were cautious. Maybe that's just something that happens when you put dung beetles in ant farms, they said. So Emlen went out and made latex casts of dung beetle tunnels in the wild. What he found was that after Raoul kisses Mrs. Big good-bye, he often continues digging sideways to intersect the tunnels of five or six other

females similarly sequestered under that same dropping.

Up until the 1970s, it was scientific dogma that the males in every species—little boy dung beetles and damselflies alike—all wanted to grow up to be fighters. That is, they wanted to acquire and defend territories and harems. At least in theory, the combined forces of natural selection (getting killed by predators or disease) and sexual selection (getting killed by rivals or chosen by females) would ruthlessly weed out any sissy alternative lifestyles.

In fact, Charles Darwin himself noticed that alternative forms persist in many species. But biologists generally ignored this insight because they couldn't explain it—or they just didn't see it in the first place. Sneaky behaviors designed to fool other members of the same species often fooled outside observers too.

"Theory determines what you see," says University of Toronto biologist Mart Gross, who's studied mating strategies in fish. And in the open-minded political and scientific zeitgeist of the mid-1970s, evolutionary theorists started to look beyond the fighter stereotype. But it required a kind of collective gulp to face up to the question of how a male might actually benefit from being smaller, weaker and, well, more effeminate.

For instance, in bluegill sunfish a significant percentage of males actually impersonate females. They wear female striping, and their eyes darken to resemble the limpid black pools of a female bluegill. They also have heightened levels of the female hormone estradiol. Gross coined the term "satellite males" to describe the way these impersonators orbit the nests of conventional males.

The conventional males frequently get fooled and invite the cross-dressers into their nests. Gross carefully documented what happens next: when a female impersonator enters a nest, he dips down, turning on one side—moving as a real female would to release eggs for the resident male to fertilize. But—*vive la différence*—the cross-dresser is in fact secretly releasing his sperm onto eggs deposited by females.

This kind of transvestite mating tactic has turned out to be surprisingly common in other species. Take the giant cuttlefish, a voluptuous, three-foot-long relative of the squid. Conventional males are the Robert Goulets or Enrique Iglesiases of the marine world; they put on a lavish, romantic display for females. A courting male waves extended, banner-like webs on his arms and turns his body into an amorous light show with bright colors and pulsing zebra stripes.

So far, so good. But sometimes a small sneaker male accompanies the happy couple and, by assuming the shape and body patterns of a female, avoids attack. Sooner or later, Goulet/Iglesias will have to drive off some other big male. In the resulting confusion, says Australian biologist Mark Norman, the female impersonator "waltzes in, sneaks under the covers, grabs the female and starts passing sperm to her." When Goulet/Iglesias comes back, the sneaker male once again tags along, looking girlish and innocent.

Cross-dressing isn't just a way to get a mate. Some female damselflies, for example, appear to imitate males for the opposite reason—to avoid being sexually harassed. Most of the time, though, cross-dressing and other sneaky ploys have just one purpose: getting the girl. Which is why the big boys of the world spend so much time and energy on what biologists call "mate guarding." (Also known, to human females, as "desperate-male clinging.") Mr. Big, the dung beetle, for instance, regularly patrols his tunnel to check on Mrs. Big, and if he catches her in flagrante delicto, he throws the interloper out. Then he immediately has sex with Mrs. Big, to displace the interloper's sperm with his own. In fact, he may have sex with her ten times a day, just to be certain—or at least a little less uncertain—that he's the father of her offspring. Waterbugs are even more anxious about paternity. In one study, a male mated with the female 100 times in 36 hours.

The burden of mate guarding, whether by fighting or marathon lovemaking, can leave even the sturdiest male feeling weak-kneed. Among northern elephant seals, a big bull who wins bloody contests against other bulls gets to stake out a stretch of beach and wallow in lubricious splendor with his harem. He may mate with 50 females in a season, while many lesser males go celibate. But defending his harem also means not going back to the sea to eat, and he typically loses about 40 percent of his weight during the three-month breeding season.

This is why "success" as a conventional male is not always all it's cracked up to be. DNA testing in red-winged blackbirds, for instance, has revealed that the longer a resident male stays away from the nest gathering food, the greater the likelihood that his putative offspring will actually be fathered by someone else. In one Australian bird species, the superb fairy wren, fully two-thirds of the offspring get fathered by somebody other than the man of the house. If male animals could perform a cost-benefit analysis, they would almost certainly conclude that it's cheaper and easier to be a sneaker

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RICHARD CONNIFF, an Average Joe, is the author of The Natural History of the Rich: A Field Guide *(W.W. Norton). Illustrator JAMES O'BRIEN lives in Saint Paul, Minnesota, and teaches at the Minneapolis College of Art and Design.*

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male. You don't need to keep up a large territory, court females, fight off rivals or provide parental care.

But is cheaper ever really better? In most species, females are the choosers when it comes to mating, and they usually seem to prefer the big boys. Northern elephant seal females, for instance, clearly regard the big beefy alpha as their best possible mate. They howl in protest when the alpha mounts them—but they howl louder and longer if a lesser male tries it, so the big bull will come thundering to the rescue.

Still, the strategy that's lord of the dance one season may be out on the street the next. Take the side-blotched lizards living among rocky outcrops in the coastal mountains of central California. They're about two and a half inches long, and conventional males typically display by doing push-ups while also puffing out the bright patch of color at their throats. Barry Sinervo, a biologist at the University of California at Santa Cruz, has identified three different, genetically determined mating tactics, each identified by a distinctive throat color.

The Big Boy orange-throats are the "ultradominants," patrolling large territories with lots of females. The Average Joe blue-throats are about 15 percent smaller, but still manage to maintain modest territories and diligently mate guard however many females they can round up. And then there are the Slacker yellow-throats, which mimic females, do no courtship push-ups and maintain no territories, but instead skulk in nooks and crannies among the rocks hoping to get lucky. It ought to be easy for everyone to spot the Slackers and make them disappear.

But is life ever that simple? If Average Joe blue-throats happen to predominate in a population, then the Slacker yellows are indeed out of luck. The blue-throats recognize them as rival males and evict them from their territories. But blue-throats never predominate for long, because the Big Boy orange-throats have the size and stamina to beat them up and take away their females. Thus orange-throats get more offspring in the next generation, and in a year or two, they supplant the blues.

Orange-throats apparently are not so bright. They don't recognize the Slacker yellow boys as rival males, so they tolerate them in the neighborhood. This allows the yellows to make what Sinervo calls "little sperm strafing runs" through orange-throat territories. After a year or two, yellow Slackers actually outnumber orange-throats. Then it's time once again for the blue-throats to make their move. In fact, the three male types regularly displace one another in the reproductive hierarchy over a four- to five-year cycle.

In many other species, the sneaky approach seems to work best when picky females concentrate their favors on a relative handful of big brutish males (or when the big brutes corral females in harems). The alpha males do best with this kind of strong sexual selection, but the overwhelming majority of conventional males wind up as losers. So sneaker males in this scenario may actually do better on average than the ordinary Joes. "Any time you have a great imbalance between the haves and the have-nots," says Purdue University biologist Richard Howard, "the have-nots find a way around." Sneaking also works better in habitats with lots of places to hide when the big guy comes fe-fi-fo-ing onto the scene.

At the very least, sneaky mating tactics provide a way for weaker males to avoid being weeded out, but they may actually be much more than that. After his work on bluegill sunfish, biologist Mart Gross went on to study coho salmon. Some coho males, called jacks, mature early, at 2 years of age, and typically measure under 15 inches in length. Others delay maturity for an extra year and become big "hooknose" males 25 inches or more in length. Sports fishermen naturally regard the hooknoses as the trophy fish, the best of the bunch. But Gross says they are not. Both jacks and hooknoses mature in open ocean, but jacks spend much less time at sea, so the percentage of jacks surviving and making it home to the spawning grounds is more than double that of hooknoses. And once they get there, the jacks are adept at hiding and darting out after a spawning female to steal fertilizations from the lumbering hooknoses. In terms of genetic fitness, says Gross, the hooknoses are in fact the weaker members of the population.

So what does all this mean for humans? To risk scientific and popcultural heresy for a moment, is it possible the real love god is not, after all, Barry White ("I'm Qualified To Satisfy You"), but some sneaker male like 5-foot-2 Prince? Not Arnold Schwarzenegger but Danny DeVito?

Alas, scientists do not go there. They are properly cautious about extrapolating from the behavior of other animals to explain ours. They might look at the story of Princess Diana and her riding instructor, James Hewitt, and mutter to themselves, "sneaker male." But the most they will say out loud is that the mating strategies of people are at least as diverse as those being studied in the rest of the animal kingdom.

In any case, our old stereotypes are unlikely to vanish overnight. And the Raouls and Slacker yellow-throats probably like it better that way. The tendency of Big Boys to regard them as harmless is their best possible protection. It is their entrée, their invitation. So relax, Mr. Big. Put your feet up, Ben, Denzel and Brad. You should know that the little guys of the world wish you nothing but sweet dreams. ○

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Around A.D. 1250, apparently seeking protection against attack, the Anasazi moved from their open villages to nearly inaccessible dwellings (opposite). A generation later they moved again.

RIDDLES OF THE ANASAZI

Toward the end of the 13th century, something went terribly wrong among the Anasazi. What awful event forced the people to flee their homeland, never to return?

BY DAVID ROBERTS

PHOTOGRAPHS BY DOUGLAS MERRIAM AND GREG CHILD

THE FOUR OF US walked slowly down the deep, narrow canyon in southern Utah. It was midwinter, and the stream that ran alongside us was frozen over, forming graceful terraces of milky ice. Still, the place had a cozy appeal: had we wanted to pitch camp, we could have selected a grassy bank beside the creek, with clear water running under the skin of ice, dead cottonwood branches for a fire, and—beneath the 800-foot-high rock walls—shelter from the wind.

More than seven centuries ago, however, the last inhabitants of the canyon had made quite a different decision about where to live. As we rounded a bend along the trail, Greg Child, an expert climber from Castle Valley, Utah, stopped and looked upward. "There," he said, pointing toward a nearly invisible wrinkle of ledge just below the canyon rim. "See the dwellings?" With binoculars, we could just make out the facades of a row of mud-and-stone structures. Up we scrambled toward them, gasping and sweating, careful not to dislodge boulders the size of small cars that teetered on insecure perches. At last, 600 feet above the canyon floor, we arrived at the ledge.

The airy settlement that we explored had been built by the Anasazi, a civilization that arose as early as 1500 B.C. Their descendants are today's Pueblo Indians, such as the Hopi and the Zuni, who live in 20 communities along the Rio Grande, in New Mexico, and in northern Arizona. During the 10th and 11th centuries, Chaco Canyon, in western New Mexico, was the cultural center of the Anasazi homeland, an area roughly corresponding to the Four Corners region where Utah, Colorado, Arizona and New Mexico meet. This 30,000-square-mile landscape of sandstone canyons, buttes and mesas was populated by as many as 30,000 people. The Anasazi built magnificent villages such as Chaco Canyon's Pueblo Bonito, a tenth-century complex that was as many as five stories tall and contained about 800 rooms. The people laid a 400-mile network of roads, some of them 30 feet wide, across deserts and canyons. And into their architecture they built sophisticated astronomical observatories.

For most of the long span of time the Anasazi occupied the region now known as the Four Corners, they lived in the open or in easily accessible sites within canyons. But about 1250, many of the people began constructing settlements high in the cliffs—settlements that offered defense and protection. These villages, well preserved by the dry climate and by stone overhangs, led the Anglo explorers who found them in the 1880s to name the absent builders the Cliff Dwellers.

Toward the end of the 13th century, some cataclysmic event forced the Anasazi to flee those cliff houses and their homeland and to move south and east toward the Rio Grande and the Little Colorado River. Just what happened has been the greatest puzzle facing archaeologists who study the ancient culture. Today's Pueblo Indians have oral histories about their peoples' migration, but the details of these stories remain closely guarded secrets. Within the past decade, however, archaeologists have wrung from the pristine ruins new understandings about why the Anasazi left, and the picture that emerges is dark. It includes violence and warfare—even cannibalism—among the Anasazi themselves. "After about A.D. 1200, something very unpleasant happens," says University of Colorado archaeologist Stephen Lekson. "The wheels come off."

THIS PAST JANUARY and February, Greg Child, Renée Globis, Vaughn Hadenfeldt and I explored a series of canyons in southeast Utah and northern Arizona, seeking the most inaccessible Anasazi ruins we could find. I have roamed the Southwest for the past 15 years and have written a book about the Anasazi. Like Greg, who has climbed Everest and K2, Renée is an expert climber; she lives in Moab, Utah, and has ascended many desert spires and cliffs. Vaughn, a tour guide from Bluff, Utah, has worked on a number of contract excavations and rock art surveys in southeastern Utah.

We were intrigued by the question of why the villages were built high in the cliffs, but we were equally fascinated by the "how"—how the Anasazi had scaled the cliffs, let alone lived there. During our outings, we encountered ruins that we weren't sure we could reach even with ropes and modern climbing gear, the use of which is prohibited at such sites. Researchers believe the Anasazi clambered up felled tree trunks that were notched by stone axes to form minuscule footholds. These log ladders were often propped on ledges hundreds of feet off the ground. (Some of the ladders are still in place.) But they would not have been adequate to reach several of the dwellings we explored. I believe that archaeologists—who are usually not rock climbers—have underestimated the skill and courage it took to live among the cliffs.

The buildings that Greg had spotted were easier to get to than most of the sites we explored. But it wasn't so easy to navigate the settlement itself. As we walked the ledge of the ruin, the first structure we came to was a five-foot-tall stone wall. Four small loopholes—three-inch-wide openings in the wall—would have allowed sentries to observe

The Anasazi often covered rock walls near their settlements with paintings and carvings of sheep, snakes, lizard-men and other animals and symbols. The outlines above were made by blowing a paint paste from the mouth against a hand held flat on the rock.

GREG CHILD; PP. 72-73 DOUGLAS MERRIAM (2)

Searching for Anasazi sites in Utah, guide Vaughn Hadenfeldt (pointing) and author David Roberts found a rare petroglyph of a ladder used to enter an underground chamber, called a kiva, via the roof. The image was created at least 800 years ago.

anyone who approached. Behind this entry wall stood a sturdy building, its roof still intact, that adjoined a granary littered with 700-year-old, perfectly preserved corncobs. Farther along the narrow ledge, we turned a sharp corner only to be blocked by a second ruined wall. We climbed over it and continued. Twice we were forced to scuttle on our hands and knees as the cliff above swelled toward us, pinching down on the ledge like the jaws of a nutcracker. Our feet gripped the edge of the passage: one careless lurch meant certain death. Finally the path widened, and we came upon four splendidly masoned dwellings and another copious granary. Beneath us, the cliff swooped 150 feet down, dead vertical to a slope that dropped another 450 feet to the canyon floor. The settlement, once home to perhaps two families, seemed to exude paranoia, as if its builders lived in constant fear of attack. It was hard to imagine elders and small children going back and forth along such a dangerous passage. Yet the ancients must have done just that: for the Anasazi who lived above that void, each foray for food and water must have been a perilous mission.

Despite the fear that apparently overshadowed their existence, these last canyon inhabitants had taken the time to make their home beautiful. The outer walls of the dwellings were plastered with a smooth coat of mud, and the upper facades painted creamy white. Faint lines and hatching patterns were incised into the plaster, creating two-tone designs. The stone overhang had sheltered these structures so well that they looked as though they had been abandoned only within the past decade—not 700 years ago.

Vertiginous cliff dwellings were not the Anasazi's only response to whatever threatened them during the 1200s; in fact, they were probably not all that common in the culture. This became apparent a few days later when Vaughn and I, leaving our two companions, visited Sand Canyon Pueblo in southwest Colorado, more than 50 miles east of our Utah prowlings. Partially excavated between 1984 and 1993 by the not-for-profit Crow Canyon Archaeological Center, the pueblo comprised 420 rooms, 90 to 100 kivas (underground chambers), 14 towers and several other buildings, all enclosed by a stone wall. Curiously, this sprawling settlement, whose well-thought-out architecture suggests the builders

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DAVID ROBERTS wrote about the Anasazi in his book In Search of the Old Ones. *He is now working on a book about the Pueblo Revolt of 1680. Photojournalist* GREG CHILD *lives near Moab, Utah, and photographer* DOUGLAS MERRIAM, *in Santa Fe, New Mexico.*

GREG CHILD

Apparently terrified of invaders, some Anasazi of the late 1200s wedged their houses and granaries into nearly unreachable overhangs in the cliffs, such as this one in southeast Utah. Each foray for food, water and supplies must have been perilous.

worked from a master plan, was created and abandoned in a lifetime, between 1240 and about 1285. Sand Canyon Pueblo looks nothing like Utah's wildly inaccessible cliff dwellings. But there was a defense strategy built into the architecture nevertheless. "In the late 13th century," says archaeologist William Lipe of Washington State University, "there were 50 to 75 large villages like Sand Canyon in the Mesa Verde, Colorado, region—canyon-rim sites enclosing a spring and fortified with high walls. Overall, the best defense plan against enemies was to aggregate in bigger groups. In southern Utah, where the soil was shallow and food hard to come by, the population density was low, so joining a big group wasn't an option. They built cliff dwellings instead."

WHAT DROVE THE ANASAZI to retreat to the cliffs and fortified villages? And, later, what precipitated the exodus? For a long time, experts focused on environmental explanations. Using data from tree rings, researchers know that a terrible drought seized the Southwest from 1276 to 1299; it is possible that in certain areas there was virtually no rain at all during those 23 years. In addition, the Anasazi people may have nearly deforested the region, chopping down trees for roof beams and firewood. But environmental problems don't explain everything. Throughout the centuries, the Anasazi weathered comparable crises—a longer and more severe drought, for example, from 1130 to 1180—without heading for the cliffs or abandoning their lands.

Another theory, put forward by early explorers, speculated that nomadic raiders may have driven the Anasazi out of their homeland. But, says Lipe, "There's simply no evidence [of nomadic tribes in this area] in the 13th century. This is one of the most thoroughly investigated regions in the world. If there were enough nomads to drive out tens of thousands of people, surely the invaders would have left plenty of archaeological evidence."

So researchers have begun to look for the answer within the Anasazi themselves. According to Lekson, two critical factors that arose after 1150—the documented unpredictability of the climate and what he calls "socialization for fear"—combined to produce long-lasting violence that tore apart the Anasazi culture. In the 11th and early 12th centuries there is little archaeological evidence of true warfare, Lekson says, but there were executions. As he puts it, "There seem to have been goon squads. Things were not going well for the leaders, and the governing structure wanted to perpetuate itself by making an example of social outcasts; the leaders executed

GREG CHILD

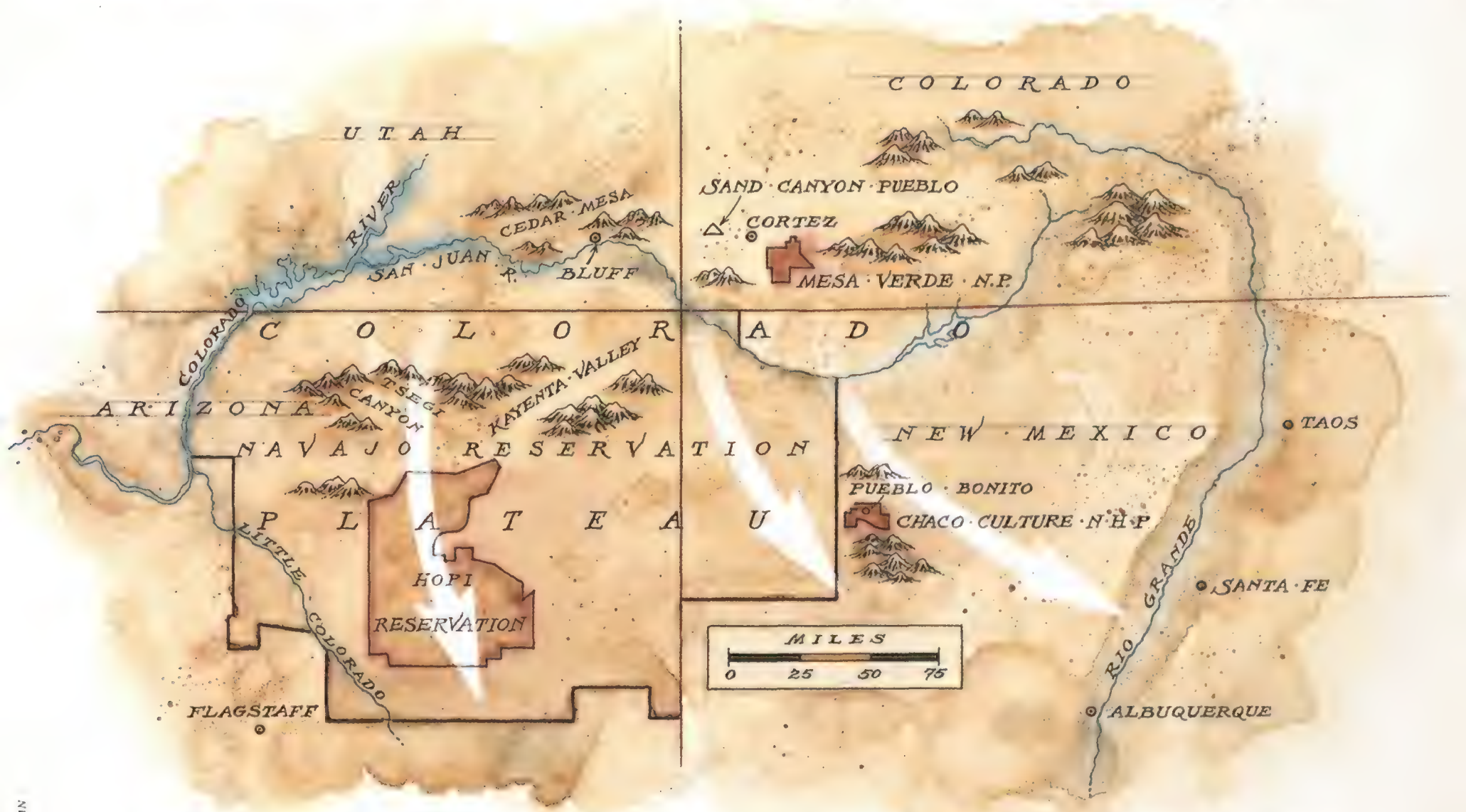
and even cannibalized them." This practice, perpetrated by Chaco Canyon rulers, created a society-wide paranoia, according to Lekson's theory, thus "socializing" the Anasazi people to live in constant fear. Lekson goes on to describe a grim scenario that he believes emerged during the next few hundred years. "Entire villages go after one another," he says, "alliance against alliance. And it persists well into the Spanish period." As late as 1700, for instance, several Hopi villages attacked the Hopi pueblo of Awatovi, setting fire to the community, killing all the adult males, capturing and possibly slaying women and children, and cannibalizing the victims. Vivid and grisly accounts of this massacre were recently gathered from elders by Northern Arizona University professor and Hopi expert Ekkehart Malotki.

Until recently, because of a popular and ingrained perception that sedentary ancient cultures were peaceful, archaeologists have been reluctant to acknowledge that the Anasazi could have been violent. As University of Illinois anthropologist Lawrence Keeley argues in his 1996 book, *War Before Civilization*, experts have ignored evidence of warfare in preliterate or precontact societies.

During the last half of the 13th century, when war apparently came to the Southwest, even the defensive strategy of aggregation that was used at Sand Canyon seems to have failed. After excavating only 12 percent of the site, the Crow Canyon Center teams found the remains of eight individuals who met violent deaths—six with their skulls bashed in—and others who might have been battle victims, their skeletons left sprawling. There was no evidence of the formal burial that was the Anasazi norm—bodies arranged in a fetal position and placed in the ground with pottery, fetishes and other grave goods.

An even more grisly picture emerges at Castle Rock, a butte of sandstone that erupts 70 feet out of the bedrock in McElmo Canyon, some five miles southwest of Sand Canyon. I went there with Vaughn to meet Kristin Kuckelman, an archaeologist with the Crow Canyon Center who co-led a dig at the base of the butte. Here, the Anasazi crafted blocks of rooms and even built structures on the butte's summit. Crow Canyon Center archaeologists excavated the settlement between 1990 and 1994. They detected 37 rooms, 16 kivas and nine towers, a complex that housed perhaps 75 to 150 people. Tree-ring data from roof beams indicate that the pueblo was built and occupied from 1256 to 1274—an even shorter period than Sand Canyon Pueblo existed. "When we first started digging here," Kuckelman told me, "we didn't expect to find evidence of violence. We did find human remains that were not formally buried, and the bones from individuals were mixed together. But it wasn't until two or three years into our excavations that we realized something really bad happened here."

Kuckelman and her colleagues also learned of an ancient legend about Castle Rock. In 1874, John Moss, a guide who had spent time among the Hopi, led a party that included photographer William Henry Jackson through McElmo



MIKE REAGAN

The Anasazi flourished for as long as 3,000 years until, in the 13th century, they fled south and east from the present-day Four Corners region where Utah, Colorado, Arizona and New Mexico meet. Archaeologists still don't completely understand why.

Canyon. Moss related a story told to him, he said, by a Hopi elder; a journalist who accompanied the party published the tale with Jackson's photographs in the *New York Tribune*. About a thousand years ago, the elder reportedly said, the pueblo was visited by savage strangers from the north. The villagers treated the interlopers kindly, but soon the newcomers "began to forage upon them, and, at last, to massacre them and devastate their farms," said the article. In desperation, the Anasazi "built houses high upon the cliffs, where they could store food and hide away 'til the raiders left." Yet this strategy failed. A monthlong battle culminated in carnage, until "the hollows of the rocks were filled to the brim with the mingled blood of conquerors and conquered." The survivors fled south, never to return.

By 1993, Kuckelman's crew had concluded that they were excavating the site of a major massacre. Though they dug only 5 percent of the pueblo, they identified the remains of at least 41 individuals, all of whom probably died violently. "Evidently," Kuckelman told me, "the massacre ended the occupation of Castle Rock."

More recently, the excavators at Castle Rock recognized that some of the dead had been cannibalized. They also found evidence of scalping, decapitation and "face removing"—a practice that may have turned the victim's head into a deboned portable trophy.

Suspicions of Anasazi cannibalism were first raised in the late 19th century, but it wasn't until the 1970s that a handful of physical anthropologists, including Christy Turner of Arizona State University, really pushed the argument. Turner's 1999 book, *Man Corn*, documents evidence of 76 different cases of prehistoric cannibalism in the Southwest that he uncovered during more than 30 years of research. Turner developed six criteria for detecting cannibalism from bones: the breaking of long bones to get at marrow, cut marks on bones made by stone knives, the burning of bones, "anvil abrasions" resulting from placing a bone on a rock and pounding it with another rock, the pulverizing of vertebrae, and "pot polishing"—a sheen left on bones when they are boiled for a long time in a clay vessel. To strengthen his argument, Turner refuses to attribute the damage on a given set of bones to cannibalism unless all six criteria are met.

Predictably, Turner's claims aroused controversy. Many of today's Pueblo Indians were deeply offended by the allegations, as were a number of Anglo archaeologists and anthropologists who saw the assertions as exaggerated and part of a pattern of condescension toward Native Americans. Even in the face of Turner's evidence, some experts clung to the notion that the "extreme processing" of the remains could have instead resulted from, say, the postmortem destruction of the bodies of social outcasts, such as witches and deviants. Kurt Dongoske, an Anglo archaeologist who works for the Hopi, told me in 1994, "As far as I'm concerned, you can't prove cannibalism until you actually find human remains in human coprolite [fossilized excrement]."

A few years later, University of Colorado biochemist Richard Marlar and his team did just that. At an Anasazi site in southwestern Colorado called Cowboy Wash, excavators found three pit houses—semi-subterranean dwellings—whose floors were littered with the disarticulated skeletons of seven victims. The bones seemed to bear most of Christy Turner's hallmarks of cannibalism. The team also found coprolite in one of the pit houses. In a study published in *Nature* in 2000, Marlar and his colleagues reported the presence in the coprolite of a human protein called myoglobin, which occurs only in human muscle tissue. Its presence could have resulted only from the consumption of human flesh. The excavators also noted evidence of violence that went beyond what was needed to kill: one child, for instance, was smashed in the mouth so hard with a club or a stone that the teeth were broken off. As Marlar speculated to ABC News, defecation next to the dead bodies 8 to 16 hours after the act of cannibalism "may have been the final desecration of the site, or the degrading of the people who lived there."

When the Castle Rock scholars submitted some of their artifacts to Marlar in 2001, his analysis detected myoglobin on the inside surfaces of two cooking vessels and one serving vessel, as well as on four hammerstones and two stone axes. Kuckelman cannot say whether the Castle Rock cannibalism was in response to starvation, but she says it was clearly related to warfare. "I feel differently about this place now than when we were working here," a pensive Kuckelman told me at the site. "We didn't have the whole picture then. Now I feel the full tragedy of the place."

That the Anasazi may have resorted to violence and cannibalism under stress is not entirely surprising. "Studies indicate that at least a third of the world's cultures have practiced cannibalism associated with warfare or ritual or both," says Washington State University researcher Lipe. "Occasional incidents of 'starvation cannibalism' have probably occurred at some time in history in all cultures."

On an 1874 expedition through Colorado's McElmo Canyon, photographer William Henry Jackson took what is probably the earliest picture of an Anasazi cliff dwelling. Guide John Moss (standing) and newspaper reporter Ernest Ingersoll are next to the ruins.

WILLIAM HENRY JACKSON / CORBIS

The Kachina Cult has sustained descendants of the Anasazi for nearly 700 years. This c. 1910 picture of Kachina dancers at the Hopi pueblo in Shungopavi, Arizona, could not be taken today; the Hopi no longer allow their dances to be photographed.

FROM COLORADO, I traveled south with Vaughn Hadenfeldt to the Navajo Reservation in Arizona. We spent four more days searching among remote Anasazi sites occupied until the great migration. Because hiking on the reservation requires a permit from the Navajo Nation, these areas are even less visited than the Utah canyons. Three sites we explored sat atop mesas that rose 500 to 1,000 feet, and each had just one reasonable route to the summit. Although these aeries are now within view of a highway, they seem so improbable as habitation sites (none has water) that no archaeologists investigated them until the late 1980s, when husband-and-wife team Jonathan Haas of Chicago's Field Museum and Winifred Creamer of Northern Illinois University made extensive surveys and dated the sites by using the known ages of different styles of pottery found there.

Haas and Creamer advance a theory that the inhabitants of these settlements developed a unique defense strategy. As we stood atop the northernmost mesa, I could see the second mesa just southeast of us, though not the third, which was farther to the east; yet when we got on top of the third, we could see the second. In the Kayenta Valley, which surrounded us, Haas and Creamer identified ten major villages that were occupied after 1250 and linked by lines of sight. It was not difficulty of access that protected the settlements (none of the scrambles we performed here began to compare with the climbs we made in the Utah canyons), but an alliance based on visibility. If one village was under attack, it could send signals to its allies on the other mesas.

Now, as I sat among the tumbled ruins of the northernmost mesa, I pondered what life must have been like here during that dangerous time. Around me lay sherds of pottery in a style called Kayenta black on white, decorated in an endlessly baroque elaboration of tiny grids, squares and hatchings—evidence, once again, that the inhabitants had taken time for artistry. And no doubt the pot makers had found the view from their mesa-top home lordly, as I did. But what made the view most valuable to them was that they could see the enemy coming.

ARCHAEOLOGISTS now generally agree about what they call the "push" that prompted the Anasazi to flee the Four Corners region at the end of the 13th century. It seems to have originated with environmental catastrophes, which in turn may have given birth to violence and internecine warfare after 1250. Yet hard times alone do not account for the mass abandonment—nor is it clear how resettling in another location

UNDERWOOD & UNDERWOOD / CORBIS

would have solved the problem. During the past 15 years, some experts have increasingly insisted that there must also have been a "pull" drawing the Anasazi to the south and east, something so appealing that it lured them from their ancestral homeland. Several archaeologists have argued that the pull was the Kachina Cult. Kachinas are not simply the dolls sold today to tourists in Pueblo gift shops. They are a pantheon of at least 400 deities who intercede with the gods to ensure rain and fertility. Even today, Puebloan life often revolves around Kachina beliefs, which promise protection and procreation.

The Kachina Cult, possibly of Mesoamerican origin, may have taken hold among the relatively few Anasazi who lived in the Rio Grande and Little Colorado River areas about the time of the exodus. Evidence of the cult's presence is found in the representations of Kachinas that appear on ancient kiva murals, pottery and rock art panels near the Rio Grande and in south-central Arizona. Such an evolution in religious thinking among the Anasazi farther south and east might have caught the attention of the farmers and hunters eking out an increasingly desperate existence in the Four Corners region. They could have learned of the cult from traders who traveled throughout the area.

Unfortunately, no one can be sure of the age of the Rio Grande and southern Arizona Kachina imagery. Some archaeologists, including Lipe and Lekson, argue that the Kachina Cult arose too late to have triggered the 13th-century migration. So far, they insist, there is no firm evidence of Kachina iconography anywhere in the Southwest before A.D. 1350. In any case, the cult became the spiritual center of Anasazi life soon after the great migration. And in the 14th century, the Anasazi began to aggregate in even larger groups—erecting huge pueblos, some with upwards of 2,500 rooms. Says Stephen Lekson, "You need some sort of social glue to hold together such large pueblos."

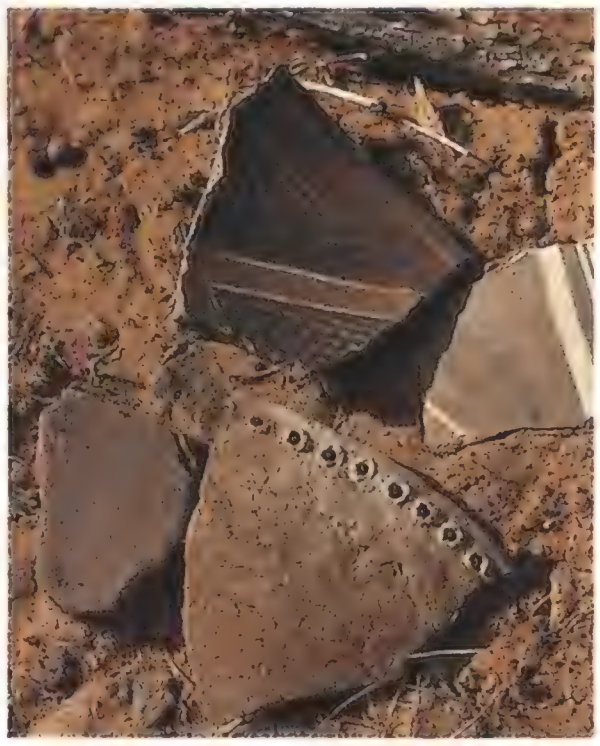
THE DAY AFTER exploring the Kayenta Valley, Vaughn and I hiked at dawn into the labyrinth of the Tsegi Canyon system, north of the line-of-sight mesas. Two hours in, we scrambled up to a sizable ruin containing the remains of some 35 rooms. The wall behind the structures was covered with pictographs and petroglyphs of ruddy brown bighorn sheep, white lizard-men, outlines of hands (created by blowing pasty paint from the mouth against a hand held flat on the wall) and an extraordinary, artfully chiseled 40-foot-long snake.

One structure in the ruin was the most astonishing Anasazi creation I have ever seen. An exquisitely crafted wooden platform built into a huge flaring fissure hung in place more than 30 feet above us, impeccably preserved through the centuries. It was narrow in the rear and wide in the front, perfectly fitting the contours of the fissure. To construct it, the builders had pounded cup holes in the side walls and wedged the ax-hewn ends of massive cross-beams into them for support. These were overlaid with more beams, topped by a latticework of sticks and finally covered completely with mud. What was the platform used for? No one who has seen it has offered me a convincing explanation. As I stared up at this woodwork masterpiece, I toyed with the fancy that the Anasazi had built it "just because": art for art's sake.

The Tsegi Canyon seems to have been the last place where the Anasazi hung on as the 13th century drew to a close. The site with the wooden platform has been dated by Jeffrey Dean of the Arizona Tree-Ring Laboratory to 1273 to 1285. Dean dated nearby Betatakin and Keet Seel, two of the largest cliff dwellings ever built, to 1286—the oldest sites discovered so far within the abandoned region. It would seem that all the strategies for survival failed after 1250. Just before 1300, the last of the Anasazi migrated south and east, joining their distant kin.

"War is a dismal study," Lekson concludes in a landmark 2002 paper, "War in the Southwest, War in the World." Contemplating the carnage that had destroyed Castle Rock, the fear that seemed built into the cliff dwellings in Utah, and the elaborate alliances developed in the Kayenta Valley, I would have to agree.

Yet my wanderings this past winter in search of 13th-century ruins had amounted to a sustained idyll. However pragmatic the ancients' motives, terror had somehow given birth to beauty. The Anasazi produced great works of art—villages such as Mesa Verde's Cliff Palace, hallucinatory petroglyph panels, some of the most beautiful pottery in the world—at the same time that its people were capable of cruelty and violence. Warfare and cannibalism may have been responses to the stresses that peaked in the 13th century, but the Anasazi survived. They survived not only whatever crisis struck soon after 1250, but also the assaults of the Spanish conquest in the 16th century and the Anglo-American invasion that began in the 19th. From Taos Pueblo in New Mexico to the Hopi villages in Arizona, the Pueblo people today still dance their traditional dances and still pray to their own gods. Their children speak the languages of their ancestors. The ancient culture thrives. ○



Despite apparent fear of violence, the Anasazi made their objects and surroundings beautiful; two examples are Kayenta pottery (above, in sherds) and a masterfully crafted wooden platform (opposite) fitted high into a fissure of Arizona's Tsegi Canyon.

DOUGLAS MERRIAM (2)

Olmsted's Triumph

One hundred and fifty years ago this month, the New York State legislature set aside the land that would become Central Park. By 1876, landscape designer Frederick Law Olmsted and architect Calvert Vaux had transformed the swampy, treeless 50 blocks between Harlem and midtown Manhattan into the first landscaped public park in the United States. Here's to New York City's 843-acre backyard!

BY WITOLD RYBCZYNSKI

CENTRAL PARK was more than 20 years old when Augustus Hepp made the cyanotype at right—created with a blueprint-like technique—but in the image, the park retains the sweet bloom of youth. He photographed the original Gapstow Bridge, a wood and cast-iron confection designed by architects Jacob Wrey Mould and Calvert Vaux, that arced over the pond near 59th Street. The bridge, completed in 1874, appears freshly painted; the water sparkles and the bushes look just-planted. The air of lazy calm is deceptive, however. From the day its southernmost section opened to the public in 1858, Central Park attracted crowds. Look at the throng on Bethesda Terrace (below) at the rim of the park's big lake on an 1894 summer day. The strollers mill about the fountain beneath Emma Stebbins' joyful winged angel. And at the water's edge, people wait to take a ride on an electric launch.

OPPOSITE: Gapstow Bridge, AUGUSTUS HEPP, *early 1880s*
ABOVE: Bethesda Terrace, JOHN S. JOHNSTON, *1894*

Family group, UNKNOWN PHOTOGRAPHER, *c. 1900*

Couple pauses for a cigarette, PHIL GREITZER, *1956*

Central Park's 843 acres have always made room for intimate moments. A family, circa 1900 (top left), sits expectantly for a portrait of their outing while the photographer adjusts his apparatus. The young man looks grumpy, but maybe he is simply tired of holding still for the long exposures. Fifty years or so later, on a snowy night, a debonair couple pauses beneath the halo of a lamp (middle left), the frozen silence broken by the click of his cigarette lighter.

Central Park is the place where all New York rubs shoulders; there is no first-class section here. A nanny and her young charge (opposite) take the sun beside an eerily deserted Conservatory Water near 72nd Street and 5th Avenue. An impeccably attired Jacqueline Kennedy (bottom left), already a widow, expertly rows her children on the big lake, which stretches east to west across the park, apparently unnoticed except by one observant amateur photographer. Very much the center of attention, three young men with shaggy haircuts pose in one of the famous horse-drawn carriages. They have arrived from England the day before, and from their beaming smiles it's clear that they know that they are about to take America by storm.

Frederick Law Olmsted and Vaux designed Central Park as an oasis of tranquillity,

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WITOLD RYBCZYNSKI teaches architecture at the University of Pennsylvania. He wrote the 1999 biography of Frederick Law Olmsted, A Clearing in the Distance *(Scribner).*

Jacqueline Kennedy, Caroline and John Jr., PETER ROSENBERG, *1964*

The Beatles sans George Harrison, FRANK HURLEY, *1964*

BETTMANN / CORBIS; PHIL GOEITZER / NEW YORK DAILY NEWS; PETER ROSENBERG / NEW YORK DAILY NEWS; FRANK HURLEY / NEW YORK DAILY NEWS; P. 82 NEW YORK PUBLIC LIBRARY, ASTOR, LENNOX AND TILDEN FOUNDATIONS; PP. 82,83 AUGUST HEPP / MUSEUM OF THE CITY OF NEW YORK

A nanny and her charge, BRUCE DAVIDSON, *1960*

BRUCE DAVIDSON / MAGNUM PHOTOS

Ice skaters in front of the Dakota apartment house, JOSEPH AND PERCY BYRON, *1894*

but it has witnessed many untranquil events. New Yorkers seem drawn there at moments of common crisis, perhaps because the city lacks a central square or plaza. In the Depression, a Hooverville shantytown sprang up at the old reservoir, now the Great Lawn, behind the Metropolitan Museum of Art. The green confines have seen many demonstrations, both for and against war. More than 50 monuments and sculptures dot the park, and there are countless less permanent tributes: a makeshift memorial to George Harrison at Strawberry Fields near Central Park West; a vigil at the Great Lawn on the anniversary of September 11.

Olmsted organized the park's first concert on July 9, 1859, and public performances, from Souza to Shakespeare to Streisand, are now a tradition. Such events, and the hundreds of movies and TV shows that have used Central Park as a backdrop, have made it as instantly recognizable as the Eiffel Tower or Big Ben.

What exactly is it that we recognize? Many cities have great parks, but New York's is the only one that runs smack into an architectural escarpment. This meeting of the natural and the man-made is palpable and oddly poignant. In Ruth Orkin's view of Sheep Meadow (opposite, top), the buildings protectively hug the misty park. Bruce Davidson catches—it is exactly the right word—four boys skylarking in the lake (below). They splash, whoop and holler as Central Park West's elegant towers look on. Here is the essence of Central Park—and of American culture: Huck Finn meets Fred Astaire. ○

Boys at play in Central Park's lake, BRUCE DAVIDSON, *1992*

MUSEUM OF THE CITY OF NEW YORK, BYRON COLLECTION; BRUCE DAVIDSON / MAGNUM PHOTOS

Mist over the Sheep Meadow, RUTH ORKIN, *1971*

Picnickers at a public concert, THOMAS HOEPKER, *1983*

RUTH ORKIN PHOTO ARCHIVE, THOMAS HOEPKER / MAGNUM PHOTOS

Some scientists race to develop vaccines against the scourge while others probe the possible lingering effects of the mosquito-borne infection

BY STEPHEN S. HALL

PHOTOGRAPHS BY GREG MILLER

On the Trail of the West Nile Virus

DURING THE DRY HOT SUMMER of 2002, a telltale silence enveloped Chicago and its suburbs like an insidious fog, too subtle to notice at first, too strange to ignore after a while. Residents in the affluent North Shore communities and the well-to-do western suburbs noticed it. Folks in the modest suburban enclaves southwest of the city noticed it. Sooner or later, in a gradual and almost dreamlike way, people all around the city realized what was missing: the sound of crows. ~ BENNIE CASALINA and Yvonne O'Neill noticed it not long after they moved in June to Oak Lawn, a town of 55,000 people a few miles southwest of Chicago. Their one-story brick bungalow is set back from the tree-lined street and has a postage stamp of lawn in front and a small yard with a little flower bed out back. Bennie, a 71-year-old retired cement mason, is a sturdy, big-boned man with a bushy mustache and a fine mop of white hair over somewhat mournful eyes. He and Yvonne, a petite straight-talking woman, have been married for 13 years. It was Yvonne who first noticed the silence. "In the whole neighborhood, you never saw birds," Yvonne said, recalling last summer. "The crows used to be out there cawing all the time, and then it got silent. You especially noticed the crows, because they're usually so noisy."

Six months after being stricken, Bennie Casalina (opposite, at home with his wife, Yvonne O'Neill) said he was almost normal again.

MICHAEL SIMON

2003-517

"There were dogs dying, and horses dying, and everyone knew someone who'd gotten sick," Dr. Melvin Wichter, of Christ Medical Center in Oak Lawn, said of last year's outbreak of West Nile virus-related disease. "It seemed to be everywhere."

On August 9, a Friday, Bennie played golf with a neighbor, went home and developed a 103-degree temperature. The next day, still feverish, he began to see double. On Sunday, he awoke a little before 8 a.m., got out of bed and took a few steps toward the kitchen before collapsing onto the floor near a framed "Home Sweet Home" sampler. He was so weak he couldn't pick himself up, couldn't move, could barely call to his wife for help. By the time an ambulance took him to Advocate Christ Medical Center a few blocks away, he'd begun to "act crazy," his wife said. He repeatedly tried to tear off his gown and had to be restrained. Then, suddenly, he lost the ability to speak, and the left side of his body became weak, almost paralyzed; he seemed "out of it," Yvonne said.

He was admitted to the hospital's intensive care unit. His doctors weren't sure what was wrong.

For weeks, Dr. Melvin Wichter had been seeing dead birds on the wooded streets around his home in Hinsdale, a suburb west of Chicago, and he, too, noticed that the familiar "cacophony of the crows," as he put it, had disappeared. As he drove to work in Oak Lawn, he passed through an area that was once prairie and was now a concrete grid of expressways and residential areas interrupted by forest preserves and cemeteries. Without quite realizing it, he was driving through an environment that had the makings of an unprecedented epidemic.

On Monday, August 12, Wichter met Bennie Casalina. The encounter was purely professional. Wichter is the president of Christ Medical Center's medical staff and its former head of neurology, and late that summer he had been watching his service fill with people suffering from meningitis, an inflammation of the membrane covering the spinal cord and brain, or from encephalitis, an inflammation of the brain itself that can cause permanent neurological damage. "Encephalitis and meningitis are always uncommon in any hospital," Wichter recalled one morning in his first-floor office. A Brooklyn native with a fringe of graying hair and a goatee, he looks something like an old beatnik. "Normally, we might *consider* encephalitis as a diagnosis maybe ten times a year, and maybe have two or three cases a year," he went on. "To us, what was remarkable was we would come into work and see two or three cases a *day*. We were doing spinal taps like crazy."

Wichter had a hunch it was something momentous, something spread by a mosquito. Roland Brilla, a neurology resident at the hospital, was skeptical. But as the test results trickled in from a state laboratory, it became clear that, as Wichter put it, "we were looking at history."

What they were seeing was an encephalitis epidemic caused by the West Nile virus, an insect-borne, or arboviral, pathogen that was first found in humans decades ago in Africa and reached the United States in 1999. And 2002 turned out to be by far the worst year yet, with the Centers for Disease Control and Prevention (CDC) reporting 4,156 cases of illness and 284 fatalities caused by West Nile virus infection, compared with just 149 cases for the previous three years combined. Illinois led the nation in 2002 with 884 confirmed illnesses and 64 fatalities; some 600 of those

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STEPHEN S. HALL is author of the just-published Merchants of Immortality: Chasing the Dream of Human Life Extension *(Houghton Mifflin). Photographer GREG MILLER, who is based in Brooklyn, specializes in photographic portraits using 8 x 10-inch film.*

cases occurred in Cook County, which includes Chicago and many suburbs. Dr. William Paul, a deputy commissioner with Chicago's Department of Public Health, watched the infection break out in the suburbs and then creep into the city, which recorded 227 cases of West Nile disease. "We knew the ingredients were there for a huge arboviral outbreak," he said. "But I don't think anybody predicted it would be this big in this part of the country." Christ Medical Center, which had 56 cases, along with Evanston Northwestern Healthcare, which had 80, turned out to be two of the hottest spots in what would quietly become the largest epidemic of mosquito-borne encephalitis ever recorded in the Western Hemisphere.

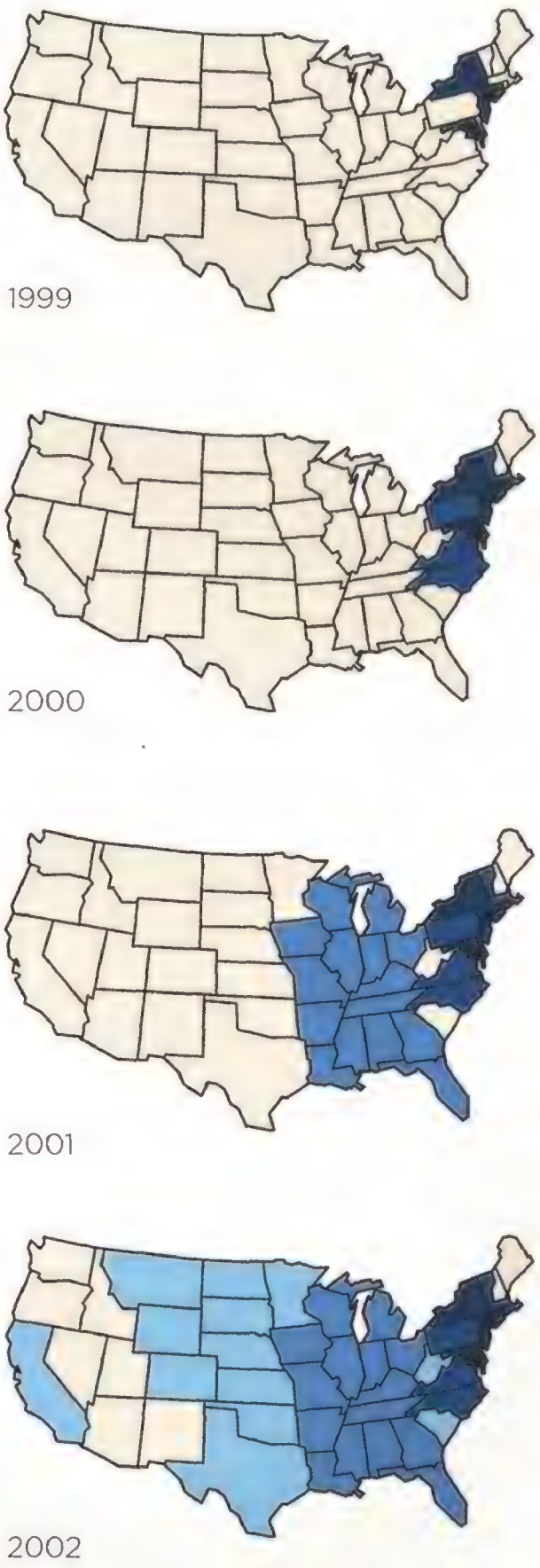
Doctors told Yvonne O'Neill that Bennie wasn't expected to recover. In early September, after Bennie had been hospitalized and essentially mute for three weeks, Yvonne pinned a copy of their wedding picture over his hospital bed. The next day, he opened his eyes, smiled and began talking again. He remained in the hospital another two weeks, and required extensive physical therapy and cognitive reconditioning after his release. He's home now, but still struggling to regain his normal strength, and not yet able to get back on the golf course. "It's hard to believe that this was caused by a little mosquito," Bennie said while standing in his yard. "But all it takes is one, I guess."

THE WEST NILE VIRUS was first detected in the United States in New York City in September 1999. I remember the autumn night that helicopters began spraying pesticides near our Brooklyn neighborhood. Like many New Yorkers, we tried to figure out how much of a threat this pathogen posed to ourselves, our children, our way of life. We tried to follow the city's recommendations to use mosquito repellent. We dutifully removed receptacles of standing water in the backyard; it turns out that innocuous children's toys, such as beach buckets or overturned plastic cars, hold enough water after it rains to breed mosquitoes. We also tried to avoid being outdoors after dusk, when the local arthropod air force was likeliest to bite, although we didn't always resist the temptation to have dinner in the garden. I had read enough about the West Nile virus to know that the infection rate was quite low, and that the rate of serious neurological illness was extremely small. But I had a more visceral reaction the morning I went to fetch my 1-year-old son from his crib and was horrified to see that mosquitoes had gnawed on his legs. It's a struggle to balance those reactions, intellectual and emotional, especially as new and disturbing information continues to pour in about a virus that has repeatedly surprised the experts.

By the spring of 2003, the virus had colonized 44 states and the District of Columbia. Last August, a woman in the Los Angeles area was hospitalized with West Nile virus infection, which she apparently acquired there, and California health officials expect the virus to make much more than a cameo appearance this year. The virus's West Coast arrival was confirmed last fall, when a horse northwest of Seattle developed fever, anorexia and an unsteady gait because of West Nile infection. Researchers aren't sure exactly how the virus spread across the nation, though migratory birds have likely contributed. The only states that haven't reported an animal or human case of West Nile virus infection are Alaska, Hawaii, Oregon, Nevada, Utah and Arizona. But Grant (Roy) Campbell, a medical epidemiologist at the CDC's Division of Vector-Borne Infectious Diseases in Fort Collins, Colorado, predicts that in 2003 "the map is likely to fill out in terms of the Western states."

Researchers say the virus is astonishingly nimble. In the past year, health officials have documented that West Nile virus can be spread to the recipient of an organ transplant from an infected donor, from a pregnant mother to a fetus, by a blood transfusion from an infected person and possibly through breast milk. The blood-banking industry is working with the CDC, the Food and Drug Administration and the American Red Cross to begin screening the blood supply for West Nile as early as this year.

West Nile virus is known to infect



Since 1999, when West Nile virus struck 62 people in four states and killed 7, the mosquito-borne infection has spread south and west, with 4,156 cases and 284 deaths last year. Eleven states, including Alaska and Hawaii, had no known human cases through 2002.

more than 160 species of birds, even a partial list of which reads like the index of an Audubon field guide: chickadees, doves, eagles, finches, grackles, gulls, hawks, herons, kingfishers, owls, pelicans, sparrows, swans, turkeys, warblers, woodpeckers and wrens. Common birds such as sparrows and house finches also incubate the virus, and some researchers suggest that those birds may play an increasingly prominent role in urban epidemics.

Nor have other animals been spared. Veterinarians in Florida discovered last year that even alligators at a reptile farm had become infected (mosquitoes apparently can bite these thick-skinned reptiles on either their soft underbellies or around the eyes). Among the other mammals that the virus has been found to infect are bats, chipmunks, dogs, rabbits, reindeer and squirrels. West Nile virus infection last year afflicted some 14,000 horses, mostly in the Midwest.

Meanwhile, it remains unclear how serious a long-term threat the virus may be to human health—whether it will cause a lot of disease year after year, as some experts predict, or settle down and cause disease only rarely. Thomas Monath, chief scientific officer of Acambis—a British biopharmaceutical firm with a facility in Cambridge, Massachusetts, that hopes to begin testing a human West Nile vaccine in the United States this summer—said 2002's heavy toll was probably only the beginning. Monath has impeccable credentials as an expert Cassandra in the field of arboviral disease. For 21 years he served at the CDC's Division of Vector-Borne Infectious Diseases, and he literally wrote the book on one of the West Nile virus's closest relatives, the St. Louis encephalitis virus. "The amplification of West Nile in 2003 could be worse than 2002," he predicted, "and I think it could be a lot worse."

in summer partly to escape the seasonal yellow fever outbreaks that swept through Washington, D.C. But since the end of World War II, thanks to mosquito-control measures such as spraying pesticides and eliminating breeding sites, mosquito-borne diseases in the United States have largely been limited to outbreaks of generally rare viral illnesses that inflame brain tissue: St. Louis encephalitis (mostly in the South and Midwest), the eastern and western forms of equine encephalitis (which occasionally strikes humans) and La Crosse encephalitis (mostly in the Midwest).

The last major outbreak of mosquito-borne disease in the United States was the 1975 epidemic of St. Louis encephalitis, in which some 2,000 people were reported to have contracted the disease and about 170 to have died. Interestingly, the St. Louis virus epidemic struck many of the same Chicago-area neighborhoods that would be visited by the West Nile virus 27 years later.

"This community has been bitten before, so to speak," said Wichter. Indeed, he took a job in 1977 at the Oak Lawn hospital because he had been intrigued by several cases of St. Louis encephalitis in the community. "I came here because of this St. Louis [encephalitis] experience," he said with a laugh, "and of course we've never seen a case since. So I've been waiting for 27 years for something to happen!"

Illinois health officials had been on the lookout for West Nile since the spring of 2000, and they identified the first infected bird the next year. In 2002, said Linn Haramis, an entomologist with the Illinois Department of Public Health, authorities began bird surveillance on May 1 "and got our first dead bird on May 2." By late July, people began showing up in emergency rooms complaining of fever, headache, muscle pain or weakness, stiff neck, sometimes with nausea or a rash; some had severe neurological problems, like mental confusion or an inability to walk. Because public health laboratories became overwhelmed with samples of blood and spinal fluid from suspected hospital cases, and also because the virus takes days to grow in the lab, physicians didn't get conclusive test results back for two or three weeks. "It was very frustrating," Wichter recalled.

Public concern exploded. In early July, the Illinois Department of Public Health was averaging 4,000 hits a week on the West Nile virus page of its Web site; by September, people seeking information were hitting the page 100,000 times a week. Local residents reported every dead crow.

Illinois health officials had been on the lookout for West Nile virus. By late July of 2002, people began showing up in emergency rooms complaining of fever, headache, weakness and other symptoms.

The southern house mosquito, right, is a leading U.S. carrier of West Nile virus.

STEPHEN HIGGS

IT IS PART OF AMERICAN MYTHOLOGY that diseases spread by the bite of mosquitoes are scourges that happen somewhere else. Malaria continues to devastate Africa and tropical regions and claims one million to three million lives every year. Dengue, or "breakbone fever," afflicts 50 million people worldwide and kills 24,000, mostly children. Yellow fever still plagues South America and Africa.

Those diseases are mostly strangers to our shores, but that wasn't always the case. Yellow fever used to roar through New York, Philadelphia and New Orleans in the 18th and 19th centuries. American presidents fled the White House

"Don't send us any more birds!" the Chicago health department urged. Seemingly every animal case of West Nile—lapdog or wolf, sparrow or raptor—made the news. Chicago officials drained neglected residential swimming pools, a prime mosquito breeding site. Cemetery groundskeepers urged mourners not to leave vases at grave sites. City workers fanned out to place larvicide tablets in Chicago's 210,000 sewer catch basins. Mosquito abatement trucks thrummed through the night spraying pesticides in the city and suburbs.

At the height of the outbreak, Wichter addressed the Oak Lawn Chamber of Commerce. Some 150 people crowded into the room to ask the questions that every community wants answered: How much of a risk does this virus pose to human health? What can we do to stop it? Wichter, who is also a professor of neurology at the University of Illinois School of Medicine, didn't have all the answers. Although health officials recommend killing adult mosquitoes quickly when an arboviral epidemic is under way, Wichter, like many neurologists, is concerned about the potential harmful effects of pesticide use. "The issue of risk-benefit is not very clear," he told the audience. "Some people will get West Nile fever, and fewer will get meningitis or encephalitis, and fewer still will have permanent disability. Only a minority of a minority will have any residual effects. So if you play that algorithm out, the numbers get really small. Is wholesale spraying justified with a disease of this benignity? You have dogs licking the grass and young children crawling through it. God knows what that will do to the [health] of our community."

"I had a bunch of birds that had died of encephalitis at the same time people had encephalitis," says Tracey McNamara (in her Bronx apartment), a veterinary pathologist formerly at the Bronx Zoo. She helped link the virus to the 1999 epidemic.

He later explained, "I could make the case for focused spraying in areas where there were large populations of mosquitoes. But I had the sense that the community wanted to see the trucks. Everyone knew someone who got sick, and they wanted to do something."

"THIS WAS GROUND ZERO," Tracey McNamara said, gesturing toward the flamingo pool at the Bronx Zoo. In an aviary just beyond the pond, terns and gulls whirled and banked. Cages holding the zoo's raptors—a regal bald eagle, hulking vultures, a snowy owl—were right behind us. You could see the apartment buildings that crowd the streets just outside the zoo boundaries. You could hear the occasional cawing of a crow.

It was in the summer of 1999 that the zoo began receiving calls from alarmed residents who had been finding dead birds, especially crows, in the city. By August, dead crows were turning up on the zoo grounds. McNamara, who until recently served as the head of the zoo's pathology department, sent dead crows to the laboratory of the New York State Department of Environmental Conservation, in Albany, for analysis; meanwhile, hundreds of dead crows were piling up in the state lab's refrigerators. McNamara, worried that some unidentified pathogen was threatening the zoo's animals, performed her own autopsies. The damage shocked her. She saw hearts ravaged by inflammation. In the brains of the birds, she saw pronounced "cuffs" of inflammation around blood vessels—the most severe brain damage she had seen in 18 years of animal postmortems.

Meanwhile, Deborah Asnis, director of the infectious disease division at Flushing Medical Center in Flushing, New York, had become alarmed by several strange cases of neurological illness at the community hospital, people with un-

explained fever and headache, gastrointestinal distress, then confusion followed by muscle weakness. Most of the victims lived in a Queens neighborhood known as Whitestone, a few miles south of the Bronx Zoo across a finger of the East River. After a flurry of behind-the-scenes activity, New York City health officials and the CDC announced on September 3 that the cases represented an outbreak of St. Louis encephalitis. Officials were ecstatic to have identified the culprit. The city immediately began spraying.

But there was a problem. All the textbooks that McNamara skimmed that Labor Day weekend agreed that St. Louis encephalitis virus doesn't kill birds. And birds were dying all over the place, including now at the zoo. The flamingos grew visibly ill, unable to hold up their heads, their elegant pink necks buckled in a desperate battle against gravity. A beloved bald eagle developed a head tremor. A cormorant swam in endless circles in the aviary pond. One by one, all those birds, and more, died.

"We lost the Guanay cormorant and a Chilean flamingo here, and the bald eagle over there," McNamara recalled as we stood by the pool. She pulled her red parka tight, seemingly against the cold March wind but perhaps also against the memory of the virus that blew through the zoo's bird population. On the morning of September 7, McNamara's assistant brought her microscope slides bearing brain tissue from the dead flamingo, which looked just like tissue from the dead crows. "I saw the same encephalitis, and my heart just sank," she said. "Because whatever it was, it was *hot*, it was bad, and I didn't know what I had been exposed to." On her way home that day, McNamara stopped to see a lawyer and drafted her will.

The coincidence was too much for McNamara to ignore. "The fact is," she said, "I had a bunch of dead birds that had died of encephalitis at the same time that people had encephalitis." McNamara—a strong personality, candid to the point of abrasion, but scientifically tenacious—refused to take St. Louis encephalitis for an answer, and the growing line of black-lidded specimen jars on a counter in her lab, each filled with the pickled tissue of the virus's animal victims, gave her plenty of motivation. Before long, it wasn't just birds. A rhinoceros developed a droopy lip, and a snow leopard became ill. Frantic for help, she sent tissue samples to the National Veterinary Services Laboratory in Ames, Iowa, which ruled out St. Louis encephalitis as well as other likely animal pathogens, and to the CDC's Fort Collins lab, which declined to analyze her samples. Meanwhile, New York State health officials sent samples from human encephalitis victims to Ian Lipkin, an expert in neurological disorders of viral origin, then at the University of California at Irvine. At the end of September, Lipkin and the CDC (which did test human samples) concluded that the pathogen was not St. Louis encephalitis after all but West Nile virus, a pathogen not previously seen in the Western Hemisphere.

The virus derives its name from the West Nile District in Uganda, where the first human case was identified in 1937. It is found in Africa, the Middle East, Eastern Europe and Asia, where it causes sporadic outbreaks of human disease. Two main lineages of West Nile virus circulate in the world, and the one that reached North America is the more virulent; it's nearly genetically identical to a strain that circulated in Israel in 1998. Whether it was carried here by an infected person or a bird or a mosquito, no one knows, and probably never will.

But the initial failure of U.S. health officials to quickly identify the pathogen exposed weaknesses in the nation's ability to detect emerging infectious diseases that occur overseas and then jet to our shores; an even more recent example of how such a disease can spread is Severe Acute Respiratory Syndrome (SARS). Indeed, some experts believe that West Nile virus is more important as a wake-up call about the danger of other jet-setting microbes than a major public health threat. In that spirit, Dominic Travis, a veterinary epidemiologist at Chicago's Lincoln Park Zoo, and McNamara, with CDC assistance, have organized a network of about 120 zoological parks in the United States to act as sentinels in monitoring the spread of West Nile among zoo animals—and perhaps to serve as an early-warning system for the arrival of other pathogens that affect humans and other animals. "The lessons to be learned from the West Nile outbreak in 1999 is that we received ample warning, at least six weeks before the first human cases," McNamara said. But because it came from wild birds, she added, "the warning was ignored."

The initial failure of U.S. health officials to quickly identify the West Nile virus exposed weaknesses in the nation's ability to detect emerging infectious diseases that occur overseas and jet to our shores.

West Nile virus (blue, magnified some 100,000 times) is named for a Uganda district.

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"WEST NILE IS EXTRAORDINARILY GOOD at adapting to this new environment," said Lipkin, who is now director of the Jerome L. and Dawn Greene Infectious Disease Laboratory at Columbia University. He takes in the Hudson River

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and seemingly half of New Jersey from his 18th-floor office. He has long studied bornaviruses, a largely obscure class of pathogens that may play a role in some mental illness. He tested the New York encephalitis samples with a variation of the method known as polymerase chain reaction, which analyzes nucleic acids, and identified the pathogen as West Nile virus, a type of flavivirus. Other flaviviruses include the ones that cause yellow fever and dengue.

Usually, an arbovirus is adapted to no more than a handful of mosquito species. By contrast, lab studies show that West Nile can take up housekeeping in at least 36 species of mosquito, making it one of the most versatile arboviruses ever. Michael Turell, an entomologist at the United States Army Medical Research Institute of Infectious Diseases at Fort Detrick, in Maryland, has shown that among the North American vectors are the northern house mosquito (*Culex pipiens*); the southern house mosquito (*C. pipiens quinquefasciatus*); a common pest mosquito in the West (*C. tarsalis*); and the recently arrived Asian tiger mosquito (*Aedes albopictus*), an aggressive daytime biter that may have played a significant role in last summer's West Nile outbreak in Louisiana, which was known to strike about 330 people and kill 25. Human victims are essentially innocent bystanders who happen to get between mosquitoes and the virus's original host, birds. The CDC currently estimates that less than 1 percent of people bitten by a mosquito infected with the West Nile virus will become severely ill.

West Nile is "extraordinarily good at adapting to this new environment," said Dr. Ian Lipkin of Columbia University, who helped pinpoint the virus in the 1999 epidemic. Still, he said, the toll is small compared with that of malaria and other global scourges.

To cause human disease, a mosquito must first bite an infected bird and pick up the virus. (Only female mosquitoes bite; they need blood protein to lay eggs.) The virus rides the slurp of blood into the insect's gut, where it must infect the gut cells, replicate, pass through the gut wall, replicate again, and spread throughout the insect's body until it reaches the salivary glands and the saliva itself. When the mosquito next bites bird, beast or person, it injects saliva, and the virus may then be passed along.

The complex transmission cycle depends on a great many factors. Consider temperature. If the temperature outdoors is 70 degrees Fahrenheit, Turell explained, it takes more than three weeks for West Nile virus to multiply throughout the body of a northern house mosquito, and only 10 percent of the mosquitoes will be able to transmit the virus. At 80 degrees F, the virus multiplies in two weeks, and 20 to 25 percent of the insects are infectious. But when the temperature goes to 90 degrees F, it takes only a week for the virus to multiply—and about 75 percent of the insects can transmit disease. It's no coincidence that human outbreaks of West Nile virus disease typically begin in the late summer: the higher temperatures favor viral transmission, the number of infected birds is high and conditions are also prime for mosquito breeding.

West Nile virus causes unusually severe infections in crows and blue jays, according to one CDC-led study that measured the number of virus particles in the birds' blood, or viremia. "I couldn't believe the incredible viremias these birds cook up," Monath, of Acambis, said of the study. "There's no precedent for it. There were from a trillion to ten trillion viral particles per milliliter of blood"—that is, in an amount of blood equal to one-fifth of a teaspoon. "That's beyond no precedent. That's almost beyond belief. No self-respecting bird can gin up a viremia higher than 100,000 particles with St. Louis encephalitis (SLE) virus. So some birds

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are almost a billion-fold more infectious with West Nile than with SLE."

At first, scientists hoped that West Nile might fail to survive the North American winter. But the virus can lurk in dormant mosquitoes. "They go into storm sewers during the winter, go dormant, and just sit there resting," said Stephen Higgs, a biologist at the University of Texas Medical Branch at Galveston. "The walls of some of these sewers are just furry with mosquitoes." Researchers suspect that the virus might also survive in mosquito eggs that overwinter and hatch in the spring. There are already hints that West Nile has reached Mexico and the Dominican Republic, where the warm climate, researchers say, may lead to year-round disease activity rather than just seasonal outbreaks.

If, as most experts agree, West Nile has become established in North America, it may be a disaster for birds and other wildlife. Veterinarians at zoos in Los Angeles and San Diego were so alarmed by the threat of West Nile that they have used an experimental West Nile virus vaccine to protect their California condors. Zoo officials nationwide are deeply concerned about the virus. "We work really hard to be the 'ark,'" said Travis of the Lincoln Park Zoo, "and this has the potential to blow through that."

The future of human West Nile virus disease is trickier to assess. One possibility is that West Nile will follow the pattern of the St. Louis encephalitis virus, which causes only about two dozen cases of encephalitis annually. Scientists still don't understand precisely why St. Louis encephalitis broke out in 1975 and has since faded. "We don't know what West Nile is going to do in the future," the CDC's Roy Campbell said. "The best indicator is to look at what SLE has done. But in fact we are making a big leap of faith in saying it's going to be like SLE."

Some experts are unwilling to make that leap, including Anthony Marfin, a medical epidemiologist at the CDC's Fort Collins branch. He sees parallels between West Nile virus and Japanese

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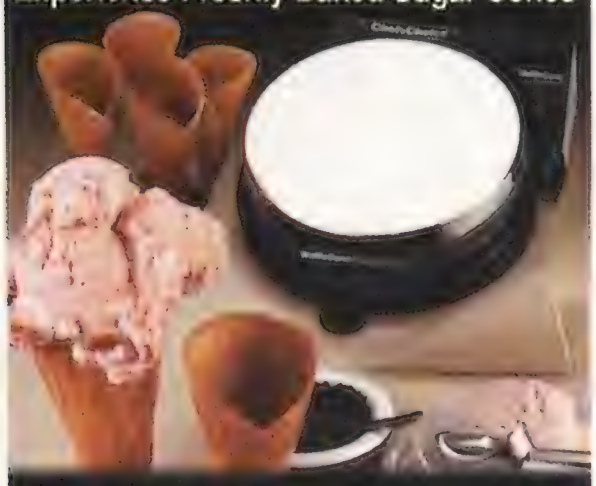
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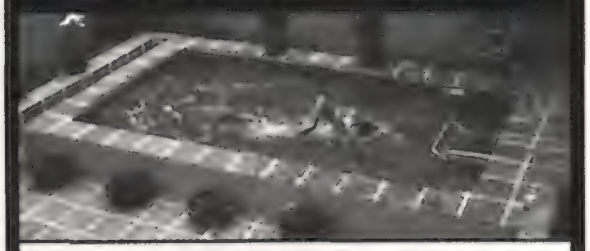
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encephalitis virus, which causes between 30,000 and 50,000 cases of human encephalitis each year worldwide, but he said there wasn't enough information yet to predict whether West Nile would become as common. Still, he speculated that eventually U.S. cases of West Nile disease may number in the hundreds each year, "with periodic explosions of thousands of cases."

Federal, state and local officials began gearing up for the 2003 mosquito season as early as this past February. The city of Chicago started eliminating mosquito breeding sites and treating catch basins with insecticide this past May. "We can't control the weather," conceded city health official William Paul. "We can't control bird migration patterns. What we can control is standing water in the urban environment."

Still, the ability of health workers to detect arthropod-borne disease has been seriously degraded over the past quarter-century. Since 1983, two National Academy of Sciences reports have warned of a looming shortage of medical entomologists and a steady decline of the infrastructure for surveillance of foreign pathogens. Both predictions have come true, according to Durland Fish, an entomologist at Yale University. "We were better prepared to deal with this 30 years ago than we are now," said Fish, who is developing satellite maps to analyze West Nile's spread. "We don't know how to predict human risk with this disease. We don't know how to measure [its spread]. And even if we could, what would we do? We'd *spray*, and that's a response that's 50 years old!"

Some experts hold out hope for a vaccine. Monath said Acambis has manufactured its West Nile vaccine by splicing two of the virus's outside proteins into a modified yellow fever vaccine, a strategy that has worked in a vaccine against dengue. Monath said that tests of the vaccine in monkeys have gone well.

Proving that a vaccine is really effective, however, won't be easy. As the CDC's Campbell pointed out, a scientifically valid clinical trial of the vaccine

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1. Blasko JC, Grimm PD, Sylvester JE, Badiozamani KR, Hoak D, Cavanaugh W, "Palladium-103 Brachytherapy for Prostate Carcinoma," Int J Radiat Oncol Biol Phys, March 2000, 46(4), 839-850.
2. Potsky AL, Legler J, Albertsen PC, Stanford JL, Gilliland FD, Hamilton AS, et al. Health Outcomes After Radical Prostatectomy or Radiotherapy for Clinically Localized Prostate Cancer: Results from the Prostate Cancer Outcomes Study (PCOS). J Natl Cancer Inst 2000; 92:1582-1592.
3. The most commonly reported side effects of prostate brachytherapy are short-term urinary or obstructive symptoms within the first few weeks after the implant procedure.

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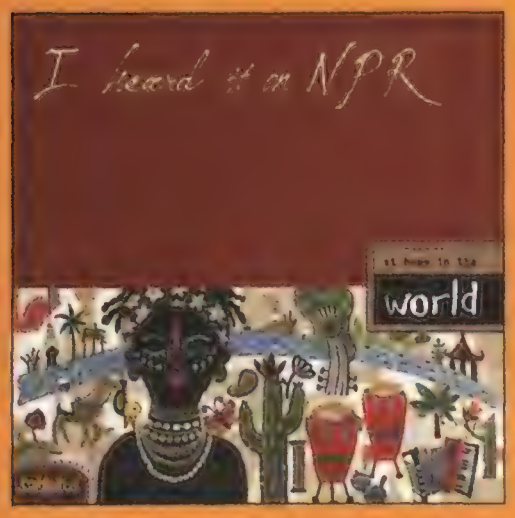

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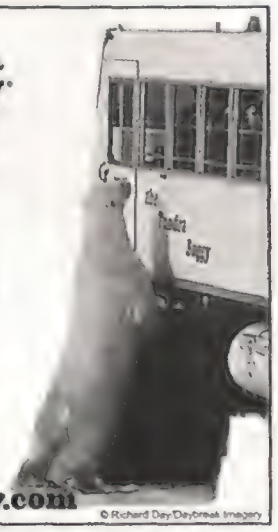

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requires a large number of people exposed to the virus. "If we had thousands of cases a year, and we could predict where they were going to be, then yes, a vaccine could be very useful," said Duane Gubler, director of the CDC's Division of Vector-Borne Infectious Diseases. (The CDC is independently trying to develop a West Nile virus vaccine.) The problem is, Gubler added, no one can yet predict where West Nile will break out next.

THERE WAS an awkward moment when I first met Bennie and Yvonne at Christ Medical Center. We were seated around a conference table in Wichter's office, and I asked Bennie if he felt back to normal after half a year. "Almost," he said with a shrug, "but still a little foggy." As he spoke, Yvonne was shaking her head. "His mind is not right, not back to normal," she said with surprising bluntness, "just in terms of his thought processes and forgetfulness."

The observation was anecdotal, but it echoed the results of a study by Denis Nash and colleagues at the New York City Department of Health, who found that only 37 percent of the people who developed West Nile meningitis or encephalitis in the original 1999 outbreak had fully recovered after 12 months. The finding raises questions about the long-term effects of West Nile infection, and whether there might be any more surprises in the clinical picture.

McNamara said something that might qualify as yet another whisper from the animal kingdom worth looking into. "We had a rhino that was symptomatic in September of 1999," McNamara said. It recovered, but after it died some months later of an unrelated physical injury, McNamara's department did a postmortem and were startled to find that the animal's brain had remained inflamed, indicating ongoing damage from West Nile infection. Later, she examined two cranes that had previously been infected, but had shown no signs of illness. Their brains, too, bore signs of encephalitis.

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"So I thought, 'Whoa, I have symptomatic and nonsymptomatic animals that have evidence of encephalitis,'" McNamara told me. "What does that mean for us?"

Clues, she went on, may be found in a 1983 study by Soviet scientists, who deliberately infected rhesus monkeys with several different strains of West Nile virus from Uganda, the Soviet Union and India. In many animals, viral infection persisted for nearly six months in the brain. Whether the infected animals developed encephalitis, or merely fevers, or no evident disease at all, autopsies found that the animal brains had undergone an "inflammatory-degenerative process." The findings are "really quite disconcerting," said psychiatrist Mady Hornig of Columbia University. She noted that the limbic region of the brains in these animals, which is associated with emotion and memory in humans, showed extensive damage, including atrophy and scarring. The implication is that people with West Nile infection who show no outward signs of illness could still harbor lingering brain infections that might ultimately produce neurodegenerative disease, an outcome previously reported with Japanese encephalitis, according to Robert Tesh, a virologist and epidemiologist at the University of Texas Medical Branch at Galveston. The number of people suffering from the long-term neurological effects of West Nile infection could be substantially larger than has been assumed. "We haven't seen that yet in humans," said Tesh, who has documented a similarly chronic, persistent West Nile brain infection in hamsters, "but it's a possibility, and it should be studied."

To be sure, medical researchers point out that the inflammation seen in animals could be medically irrelevant, like a scar that looks bad but doesn't impair function at all. But researchers are only beginning to study the possible long-term health effects of viral infection. James Sejvar, a CDC physician, has studied 16 people in Louisiana infected by the West Nile

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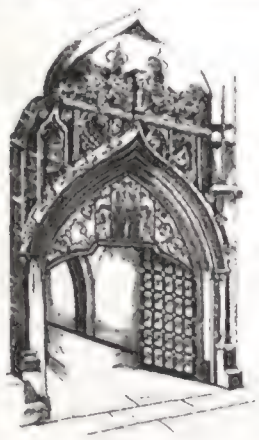

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virus. The most severely affected were three who developed a polio-like form of paralysis and had not improved after eight months. "It's likely to be a persistent syndrome, so that's kind of worrisome," said Sejvar, who also said that some of the patients with meningitis and milder forms of encephalitis felt that they'd returned to normal after four months.

At a conference on West Nile virus sponsored by the CDC this past February in New Orleans, McNamara, who has a history of describing aspects of West Nile that people don't necessarily want to hear, mentioned the long-term neurological damage she'd seen in infected birds that had never been obviously sick. "The room got very silent," she recalled. As one health official later put it, "People are scared enough already."

As the 2003 West Nile season draws near and I look out over all the water-friendly nooks and crannies in our backyard garden, each a potential incubator of mosquitoes, I realize that we know much more about West Nile now than in the fall of 1999, when the pesticide-spraying helicopters first flew overhead. I'm still reasonably persuaded that West Nile viral disease represents minimal risk to my family, but that risk is not totally in focus, and throughout the virus's short sojourn in North America, birds and other animals have repeatedly tried to tell us something about the disease, and we haven't always been particularly good listeners. While the scientists sort out the messages from the rhinos and monkeys and cranes, I'm going to be listening for the buzz of mosquitoes, and keep out of the line of fire. ○

Researchers studying the effect of West Nile virus on wildlife presented findings this past February at the Smithsonian Institution's Environmental Research Center (SERC) in Edgewater, Maryland. A summary of the work will appear in July on SERC's Web site, www.serc.si.edu/migratorybirds/migratorybirds_index.htm and on the CDC's Web site, www.cdc.gov/ncidod/EID/index.htm.

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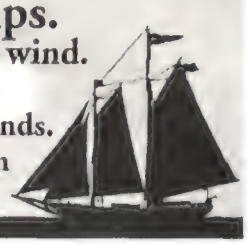

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North to Freedom

A groundbreaking chronicle sheds new light on one of the most dramatic chapters in American history – REVIEWED BY FERGUS M. BORDEWICH

BEYOND THE RIVER: THE UNTOLD STORY OF THE HEROES OF THE UNDERGROUND RAILROAD

ANN HAGEDORN

SIMON & SCHUSTER, $25

Perhaps as many as 100,000 slaves fled north along Underground Railroad way stations (such as this central New York farm, depicted in this study for a WPA mural, c. 1940).

FEW STORIES IN American history combine as much suspense, adventure and moral righteousness as the Underground Railroad—the far-flung system of safe houses established to enable between 50,000 and 100,000 fugitive slaves to reach the Free States and Canada in the decades before the Civil War.

Until recently, few books have penetrated the character and motives of the estimated 3,000 men and women who, as they aided fugitives and led them to safety, constituted the Underground Railroad. Ann Hagedorn reveals how it functioned in an Ohio River town that became one of the most significant centers of abolitionist activity. Ripley, just east of Cincinnati, is today a sleepy hamlet whose largely deserted waterfront belies its tortured, violent history, when slave hunters tracked fugitives through the surrounding countryside and gun battles erupted in its now quiet lanes.

From the 1830s to the 1860s, John Rankin, a farmer, was the linchpin of Ripley's Underground Railroad. Well before the Civil War began, the Ohio River separated North and South, in effect two separate nations engaged in a cold war over the issue of slavery. Escapes across the Ohio were no less dramatic than those across the Berlin Wall more than a century later. Rankin's house, which still stands, atop a steep hill behind the town, was a beacon of liberty. . . quite literally. Hagedorn writes that the light in the Rankins' window burned so brightly it could be seen for miles, "its radiance . . . amplified by the hopeful spirit it invoked among those who wanted to believe that there was a better life beyond the river."

Passage of the Fugitive Slave Act of 1850 required all citizens, no matter their beliefs, to assist in the capture of fugitives. The effect of this abrogation of liberties in the furtherance of slavery was to swell the ranks of the Underground Railroad. Although Rankin's enemies, as late as 1856, were still burning his anti-abolitionist writings, "the roster of citizens willing to help runaways was growing," Hagedorn writes. "New recruits bolstered the spirits of those who had labored for many years in the underground movement." ○

Reviewer FERGUS M. BORDEWICH is writing a history of the Underground Railroad, to be published by HarperCollins next year.

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DETAIL: SMITHSONIAN AMERICAN MUSEUM OF ART / ART RESOURCE

Haute Tomato

I can forgive the French almost anything. Except dessert ~ BY EDITH PEARLMAN

I SO ADMIRE THE FRENCH—their ability to carry a dinner table argument all the way into next week; their taste for crimes of passion; even their penchant for unpredictable diplomacy. I especially admire their authority in matters of cuisine. So when, at a restaurant in Paris not long ago, I saw that *Tomate* was on the Dessert List, I reverently ordered one. It would be a deconstructed tomato, I guessed, put together again with a paste of thickened absinthe; or, lightly flayed, it would float in a Proustian *tisane*.

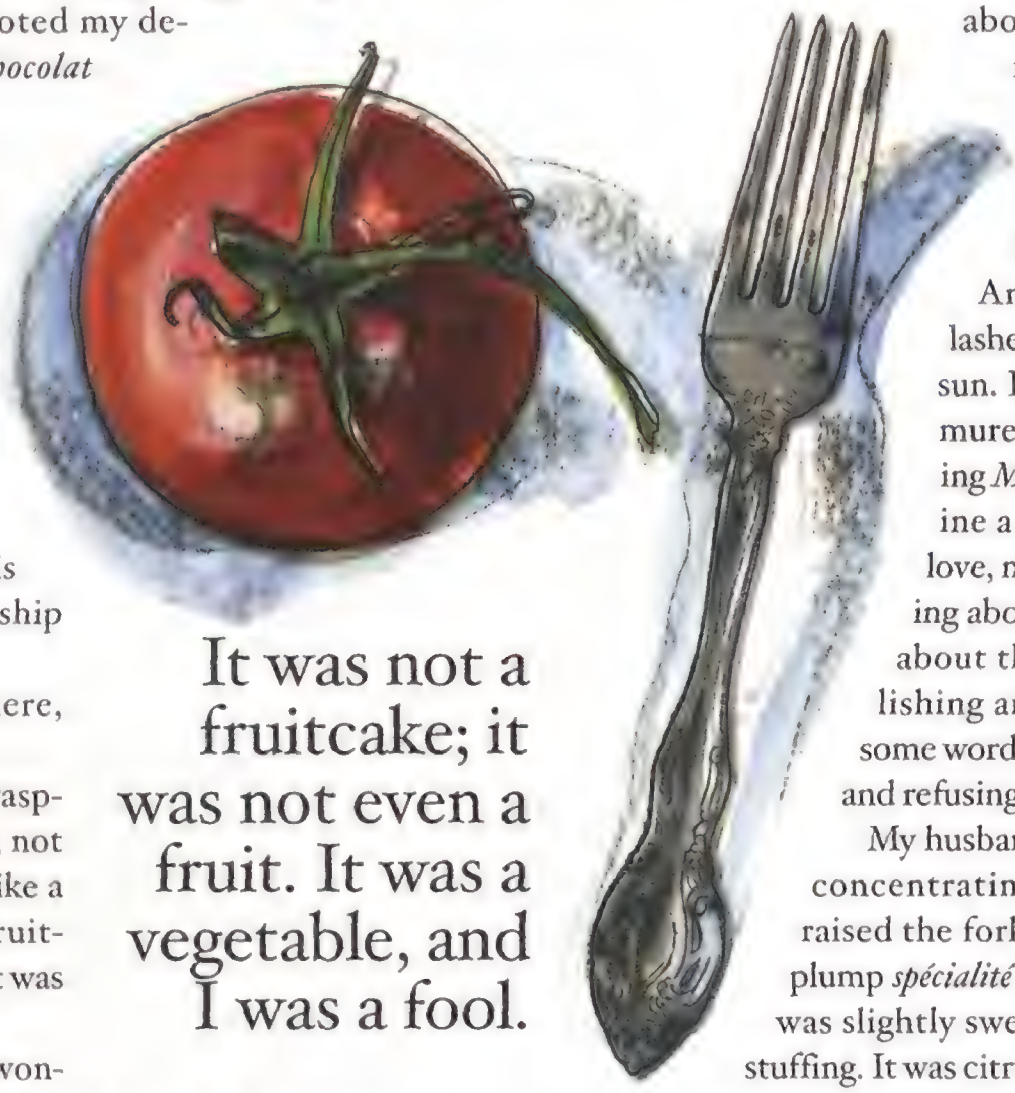
My husband favored me with a sigh suggesting that the family had long noted my derangement. He ordered *Chocolat Mystérieux*.

The desserts came.

His was a chocolate cake dense as fudge, topped with chocolate cream light as laughter, surmounted by curls of chocolate. More chocolate, liquid this time, swirled around this masterpiece like fanciful script. This is no fruitcake, the penmanship seemed to say.

Mine was a hot red sphere, alone and aloof.

It was not covered with raspberry sauce like *Pêche Melba*, not slathered with *crème fraîche* like a baked apple. It was not a fruitcake; it was not even a fruit. It was a vegetable, and I was a fool.



It was not a fruitcake; it was not even a fruit. It was a vegetable, and I was a fool.

I glared at my vegetable, wondering whether, if I plunged a knife into the headwaiter, a French jury would let me off. Our own judiciary had once considered a case of fruits v. vegetables, I happened to know; in 1893 the U.S. Supreme Court (*Nix v. Hedden*) held that a plant or plant part eaten during a main course was a vegetable and one eaten afterward was a fruit. But the tomato I was confronting, whatever nine old white men wanted to call it, belonged in a salad, preferably on someone else's plate.

Still—surely it was stuffed with something. Maybe that *sommelier* in tails would glide in our direction and pour cognac on it and set it on fire, and inside its ashes I'd find a small charred blackbird or a *chèvre*. I smiled winsomely at the *sommelier*. He examined his fingernails.

I lifted my fork. My husband's arm encircled the *Mystérieux* to protect it from an idle spurt. I lowered my fork. With a cautious forefinger I stroked the warm tomato—perhaps a fruit after all, I relented, if only because it carried the seeds of the next generation. Oh, sure, zucchini is fruit too. But there is something sluttish about that fecund squash; not even Parisians serve it up sugared as a *pièce de résistance*. The tall tomato plant has nobility, I observed aloud. And it's a martyr, isn't it, lashed to its stake under a hot sun. It is faithful, too, I murmured to the fast-disappearing *Mystérieux*; can't you imagine a tomato plant falling in love, mating for life and worrying about the children; fretting about the language and establishing an academy that admits some words and turns down others; and refusing to buy British beef?

My husband didn't answer; he was concentrating on his dessert. So I raised the fork again and pierced the plump *spécialité*. I took a bite. The flesh was slightly sweet. There was indeed a stuffing. It was citrusy, and at the same time nutty, and also gingery and minty, too—it was as various as Voltaire, as delicate as Dufy, as mysterious as the shadows of Montmartre. Mysterious. But not chocolate. The *Mystérieux* itself, I saw, was almost gone. "*Égalité, Fraternité*," I breathed, deftly switching plates with my all-suffering spouse. "Tomatoes always share; it's part of their Belief System," I instructed as I gobbled up the last of his dessert; he could enjoy the rest of mine. "*Liberté*," I assured him.

He produced his familiar, suggestive sigh. ○

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PROGRAM OF EVENTS

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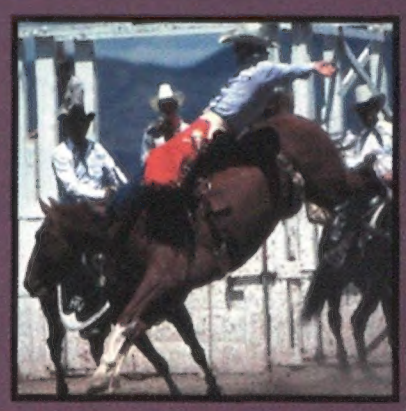

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PROGRAM OF PUBLIC EVENTS

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FRIDAY, SEPTEMBER 19

5:30-6:30pm

America's Love Affair with the Cowboy

Expert: Lonn Taylor

■ **Palace of the Governors, Museum of New Mexico**
110 Washington Avenue
Santa Fe
For information, call (505) 476-5109.

Schedules may change.
For additional information and program details, go to www.culturefest.com or call (800) 774-5020.

All programs free of charge unless otherwise noted.

SATURDAY, SEPTEMBER 20

10:30am-12:00 noon

Mexican Dance

Expert: Gregorio Luke
Performance by Los Niños de Santa Fe y Compania

■ **Museum of International Folk Art, Museum of New Mexico**
Museum Hill, Camino Lejo
off Old Santa Fe Trail
Santa Fe
For information, call (505) 476-1200.

1:00-2:00pm

Spanish Colonial Architecture

Expert: Lonn Taylor

■ **Museum of Spanish Colonial Art**
Museum Hill, Camino Lejo off Old Santa Fe Trail
Santa Fe
For information, call (505) 982-2226.

2:30-4:30pm

Bus Tour of Local Spanish Colonial Architecture

■ **Museum of Spanish Colonial Art**
Museum Hill, Camino Lejo off Old Santa Fe Trail
Santa Fe

Tour limited capacity; reservations required.
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SATURDAY, SEPTEMBER 20

12:30-4:30pm
[detailed times below]

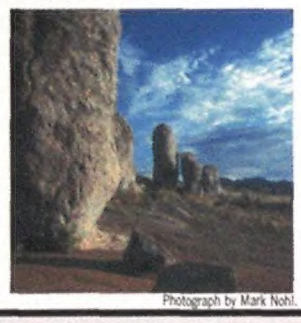
Family Art Day
Children ages 5-10

■ **Santa Fe Children's Museum**
1050 Old Pecos Trail
Santa Fe

Program One: CultureFest Collage Creation
Including the chance to win a family trip to the Smithsonian Institution in Washington, D.C.!
Session 1:
12:30-1:30pm
Session 2:
3:30-4:30pm

Program Two: I Got Rhythms
Expert: Anthony Brown
Making and using a percussion instrument.
Session 1:
2:00-3:00pm
Session 2:
2:30-3:30pm

Program free with Museum Admission.
For information, call (505) 989-8359, ext. 112.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CultureFest is coordinated by The Smithsonian Associates (TSA). Established over 30 years ago as the membership, cultural and educational arm of the Smithsonian Institution, TSA is recognized as the world's largest, most-esteemed, museum-based continuing education and study tour program.

SATURDAY, SEPTEMBER 20

3:30-4:30pm

What the Cowboy Said: Cowboy Literature

Expert: Lonn Taylor

■ **Santa Fe Public Library**
145 Washington Avenue
Santa Fe
For information, call
(505) 955-6791.

7:00-8:30pm

Mexican Muralists

Expert: Gregorio Luke

■ **El Museo Cultural de Santa Fe**
1615B Paseo de Peralta
Santa Fe
For information, call
(505) 992-0591.

7:00-8:30pm

A Salute to Duke Ellington: Concert and Commentary

Expert: Anthony Brown and Friends

■ **Museum of Fine Arts, Museum of New Mexico**
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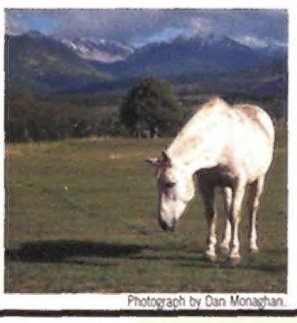

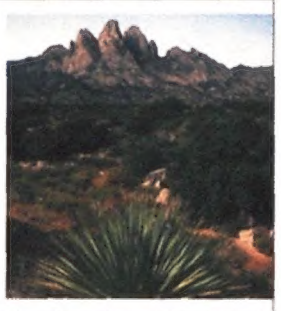

Photograph by Dan Monaghan.

Photos courtesy of New Mexico Department of Tourism.

SUNDAY, SEPTEMBER 21

10:00am-4:00pm

Family Day

■ **El Rancho de Las Golondrinas**
334 Los Pinos Road
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Throughout the Day:
Cowboy re-enactments, roping demonstrations and lessons.

Program:
Cowboys: Real and Imagined
Expert: Lonn Taylor
1:00-2:00pm
[One session only]

Program free with Museum Admission.
For information, call
(505) 473-4169.

1:00-2:00pm

Art of Early Mexico

Expert: Gregorio Luke

■ **Palace of the Governors, Museum of New Mexico**
110 Washington Avenue
Santa Fe
For information, call
(505) 476-5109.

2:00-3:00pm

Intercultural Influences in Jazz

Expert: Anthony Brown

■ **Santa Fe Public Library**
145 Washington Avenue
Santa Fe
For information, call
(505) 955-6791.

3:00-4:30pm

Pre-Hispanic Mexican Cuisine

Expert: Gregorio Luke
Discussion & Tasting

■ **The Canyon Restaurant**
731 Canyon Road, Santa Fe

Cost: $15 (includes food, non-alcoholic beverage and gratuity)
Limited seating. For reservations, call (505) 984-3270 and mention "CultureFest."

ABOUT THE SMITHSONIAN EXPERTS

Dr. Anthony Brown

Dr. Anthony Brown has been called "one of the most articulate men in jazz" by the *San Francisco Chronicle*. Dr. Brown has performed and recorded with jazz greats around the world. Recently named a 2003 Guggenheim Fellow, he currently directs the Grammy-nominated Asian American Orchestra. He is a visiting professor of music at UC-Berkeley and was curator of American Musical Culture and director of the Jazz Oral History Program at the Smithsonian National Museum of American History from 1992-96.

Gregorio Luke

A frequent Smithsonian lecturer and an expert in Mexican art and culture, Gregorio Luke is the Director of the Museum of Latin American Art in Long Beach, California. He was formerly the Consul of Cultural Affairs at the Consulate General of Mexico in Los Angeles, and the First Secretary of the Embassy of Mexico and head of the Mexican Cultural Institute in Washington, D.C. Mr. Luke received a 1992 Mayoral Citation from the District of Columbia for promoting Mexican Culture, and in 1995, he was conferred the Irving Leonard Award by the Hispanic Society of the Library of Congress.

Lonn W. Taylor

Lonn Taylor is a specialist in Southwestern U.S. history and culture. Formerly a Curator at the Smithsonian's National Museum of American History, he was also the museum's historian for the Star-Spangled Banner Conservation Project. Mr. Taylor has held curatorial positions at the Museum of New Mexico, the American Folklife Center at the Library of Congress, the Dallas Historical Society and the Winedale Historical Center in Austin, Texas. He has taught at Colorado College, the University of Texas at Austin and Texas Christian University. A prolific writer, Mr. Taylor is the author of several books.

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